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# PRIMER OF INDUSTRY



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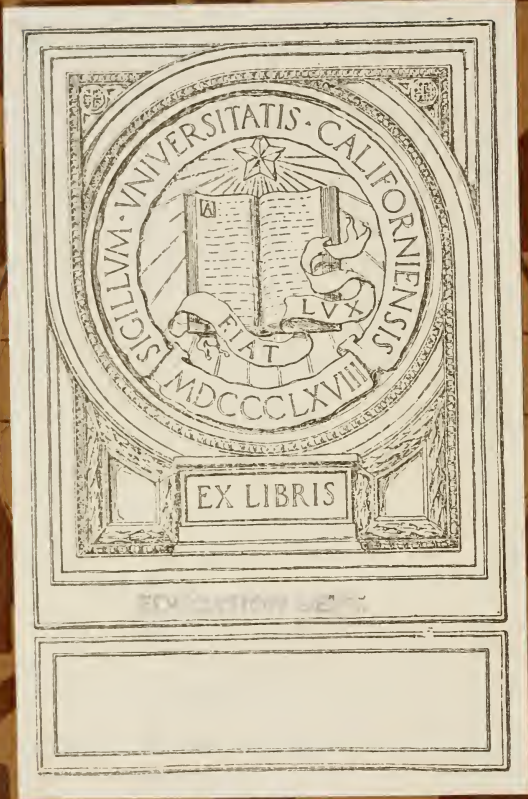


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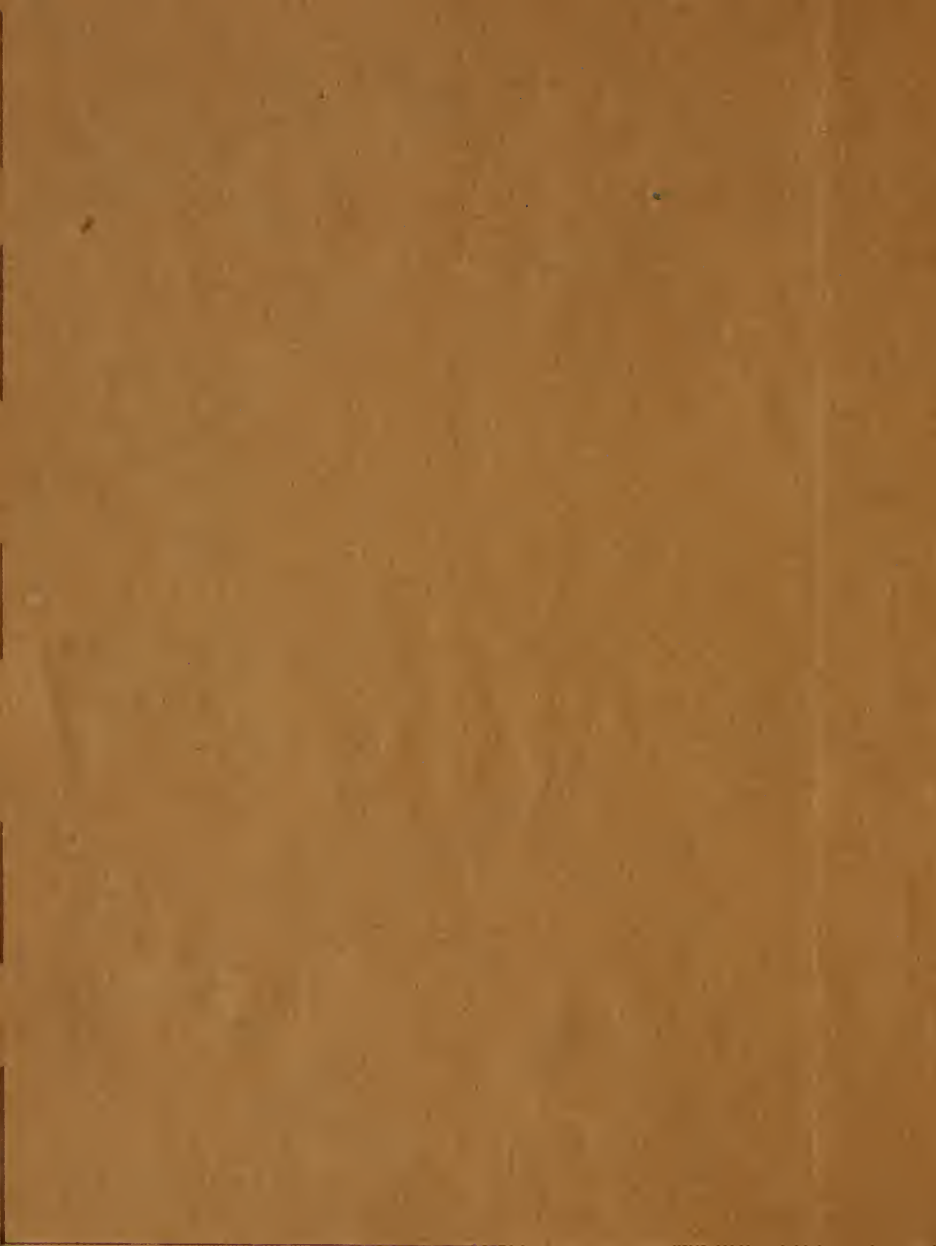
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# PRIMER OF INDUSTRY



By Austin Craig  
Author of the Story of Rizal

Yonkers-on-Hudson New York  
WORLD BOOK COMPANY  
and Manila  
1912

LB 1541  
C7

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EDUCATION DEPT.

## TO THE TEACHER

*Primer of Industry* furnishes suggestions for occupations and exercises which are pleasant, profitable, and instructive, and at the same time are not so burdensome to the child that he will regard them as work. These exercises are designed, not simply to keep the children entertained and occupied, but to lay the foundation for an industrial training correlated with language and number work. In all the occupations the teacher or older pupil who directs the children must avoid every appearance of giving formal lessons.

While the exercises are clearly and definitely pictured so that the children can easily follow them, the full results cannot be attained unless the teacher reads the notes carefully, makes a program for each day's work, and directs the pupils intelligently. The teacher will be helped by reading *Industrial Studies and Exercises: Teachers' Edition*, particularly Chapters I, II, and IX.

It is not intended that any one kind of exercise be fully covered before proceeding to the next. After having laid some of the designs with sticks, the children may lay the same forms with shells or seeds (page 32), or perforate them (page 38), or sew them (pages 41, 42). Tablet laying, tangrams, grass and string ornaments — all these exercises may appear in the program of the early weeks. This varying of exercises adds interest. Moreover, the forming of a design from different materials fixes the design upon the child's mind, and also shows him that some designs appear better in one material and others look better worked with other materials.

Children like to talk about their plays and games; therefore it is easy to correlate language work with every exercise. Do not attempt formal language work. Simply show them how and what they can say about the things that interest them. The children will want to learn the name of every material with which they work and something about it. Let them examine the material by feeling it to tell if it is *rough* or *smooth*, *hard* or *soft*, *thick* or *thin*, etc.; also let them compare materials to tell which is *thicker* or *thinner*, *rougher* or *smoother*, *wider* or *narrower*, etc. Also let them look at the material carefully to examine the color, strength, elasticity, etc.<sup>1</sup>

Counting exercises are interesting and should be given frequently. Let the children count their sticks, tablets, etc. In sewing, they must

<sup>1</sup> Read Reimold's *Industrial Studies and Exercises: Teachers' Edition*, pages 121, 122, 127-129.

count perforations and stitches in order to get the patterns correct. The exercises in this book suggest a great variety of number work.<sup>1</sup>

The teacher should not be content simply with keeping his pupils busy. The pupils will be more satisfied if they feel that what they are doing has some significance, that their occupation is important, and they will feel this, if the teacher realizes the full value of the work. He must always have in mind the relation of the children's work to the real industrial work for which he is preparing them. Although it is essential to cultivate accuracy, neatness, and similar qualities and habits, the teacher must be careful not to be too severe with beginners. Stimulate better effort by letting the class look at the good work of some pupil. With children, praise is very effective; but poor work should never be praised.

Children should be given much freedom to invent designs of their own. There are suggestions for this work throughout the book, and the results depend much on the teacher. If children do nothing but copy designs, they will be mere copyists all their lives, and therefore can never become first-class craftsmen. Let them see that all about them are suggestions of forms which they can adapt to use in decorating their work. The first step to invention is to modify or change some form that the pupil has copied, as is suggested on pages 18 and 19.<sup>2</sup>

It is hoped that this book will help solve the problem of making the work of Grade I thoroughly efficient. So many children in the Philippine schools get little more than the work outlined for this first year that it is highly important that they should get as much good as possible out of the grade. In doing the work outlined in *Primer of Industry*, the Filipino child will become literate, that is, he will be able to read and will have been taught the rudiments of writing even before he reaches the regular school work of the first year. The idea of a child's first book so fully illustrated that the book alone will serve for a guide to him is very old, but this application of it is new. The work requires no great equipment, as much of it can be done without even pencil or paper. Some material that will serve for any of the exercises may be found within easy reach of every Philippine town. In the matter of direction, even, the book makes no demand for a large number of teachers, as the work is of a kind that older pupils can supervise easily and well.

<sup>1</sup> Many helpful suggestions for number work will be found in Bonsall's *Primary Arithmetic: Parts I and II*.

<sup>2</sup> Consult Reimold's *Industrial Studies and Exercises: Teachers' Edition*, pages 120, 121, 185.



## I. STICK LAYING

It must not be inferred that the other exercises in this book are of less value than stick laying because less space is given to their treatment. Many of the suggestions given here should be applied to the other exercises.

**Value.** Stick laying is especially valuable for beginning exercises because the material is easily procured and prepared. It requires no special practice, yet it develops skill of hand and fingers. The child needs only the suggestions illustrated on the following pages and a bunch of sticks, and he is soon interested and occupied.

**Material.** At first let the children work with sticks about 8 centimeters long; the sticks should be of uniform length. For the border work short and long sticks are required; the long sticks may be 6 centimeters long and the short ones half as long.

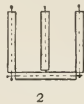
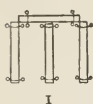
**Number work.** The models illustrated on pages 8 to 16 are grouped according to the number of sticks required to make them. The children will easily get the idea of numbers by the teacher using such expressions as these: "Today we shall make pictures with three sticks." "Make a chair with four sticks." "A table with six sticks." "Take six sticks and make a tree." If the children have made a certain picture, ask: "How many sticks did you use to make your —?" Let the children count the sticks to be used in making one picture and then in another. Then let them tell how many sticks they used in both. Again, let them take seven sticks and say: "Make something of four sticks." Then ask: "How many sticks are left?"

**Imaginative and inventive work.** As far as possible let every form that the child makes mean something to him. It should be more than simply sticks. On page 8, No. 1 is the letter L; No. 5 is T; No. 9 is a roof or house; etc. Ask the children to make pictures of objects in the school, at their homes, etc. On page 16, Nos. 1 and 2 made together represent the schoolhouse, fence, and flag; No. 1 may also be used with Nos. 3 or 5; other combinations may be made with these parts, and the children may invent new positions.

**Relation to drawing.** No exercise offers better preparation for drawing than stick laying. A misplaced stick is more easily corrected than a pencil line wrongly drawn. Children will like to lay sticks on sand, and, by pressing the sticks down into the sand, make an impression of their picture.

Pupils may also draw in sand with a small pointer the forms they lay with sticks.

**Sewing straws or sticks.** If the children wish to keep their stick designs, they may sew the sticks to leaves or paper, as shown here in No. 1; No. 2 shows how some forms may be outlined by using straws on leaves or paper. On page 32 is shown an alphabet, made by sewing straws on paper or leaves.



**Border work.** Beginners may make simple borders by simply representing units at uniform intervals, as on pages 8 and 9. Let the pupils measure the distance between the units with their sticks. The teacher can suggest border work as follows:—

Make a border using the letter H; the letter X; the letter Z. Make a border using the letter T, first right side up; then upside down; the same letter can be suggested alternately. The same can be suggested with V and L. Let borders be made by using triangles, squares, trees, etc. The border work suggested on pages 18 and 19 may be carried on throughout the first year. It is excellent preparation for formal design in drawing, weaving, etc. This designing teaches the importance of careful measurements and apportionment of spaces. Since the sticks are of uniform length, much of the measuring is done automatically by simply placing the sticks, as suggested in the next paragraph. Thus the child, first unconsciously and then consciously, learns measuring and its value in designing. In all border work, insist that the sticks be laid regularly; that the units be laid in straight lines, and be separated by uniform spaces. Let the lines at the top and bottom of borders be straight lines laid of sticks so that the joints on one line are opposite the middle of the other line, as the illustrations show. Then the children can use the joints for measuring points. For example, if the sticks are to be laid at intervals of 3 centimeters, the first stick is laid for the first joint of the lower line, the second stick under the first joint of the upper line, etc., as in No. 1, page 18. Often a border is unattractive because the design is too crowded.

**Success in designing largely dependent upon the proper handling of space.** The best borders are not always those of complicated designs. Number 1 on page 18 shows that an attractive border can be made by using simply the unit of a stick. Numbers 3 and 4 on page 7 show how the same unit is used, but the result is unpleasing because in one

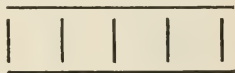
case there is not enough space, and in another case there is too much space. Number 5 shows the result when the spaces between the units are uniform. Inventiveness is developed by letting children modify designs that they have laid; for instance, by taking out every third stick from No. 1 on page 18, they get No. 2. Number 2 is easily changed to Nos. 3 and 4. Going back again to No. 1, Nos. 5, 6, 7, and 8 are easily developed; also Nos. 9 and 10.

Let the children look about them for suggestions and inspiration in their original designing. Let them see the artistic value of forms familiar to them. On page 19, No. 10 is a border with a tree unit; No. 12 might mean a fisherman's house and boat; No. 13 may represent the schoolhouse and a tree. Inside the front and back covers of this book is a suggestion of how the house can be artistically applied.

Too much cannot be said of the value of the imagination in art; in fact, without imagination there is no art. Simple imitation and copying cannot be art, for it does not express the thoughts and feelings of the copyist. The art of people who died long ago, lives today because it is alive with the thought and imagination that they worked into it. Moreover, it is only through imagination that a people develops its characteristic art; it is this which gives us the art of the Greeks, the Romans, the Japanese, the American Indians. The Filipinos must develop their own art.



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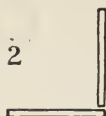
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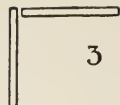
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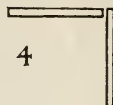
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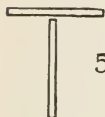
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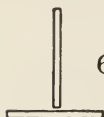
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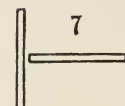
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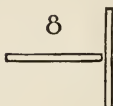
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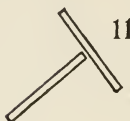
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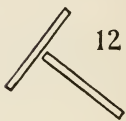
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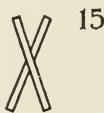
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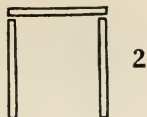


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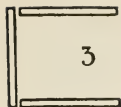
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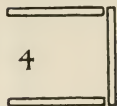
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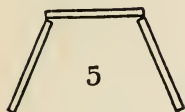
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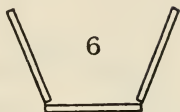
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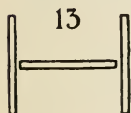
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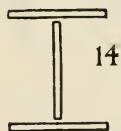
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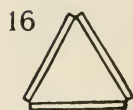
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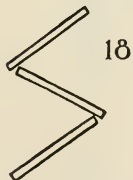
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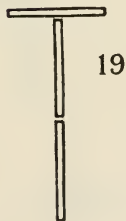
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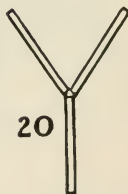
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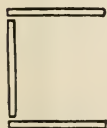
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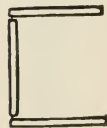
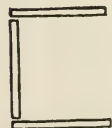
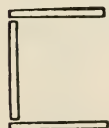
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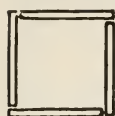
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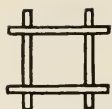


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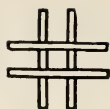
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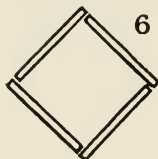
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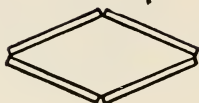
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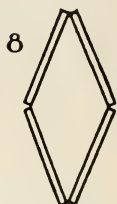
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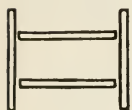
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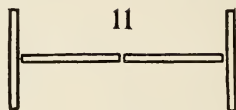
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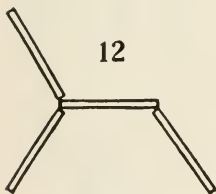
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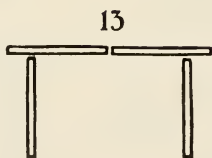
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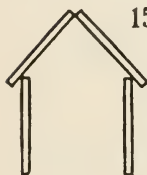
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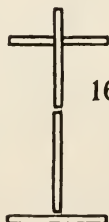
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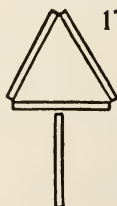
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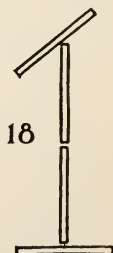
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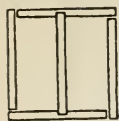


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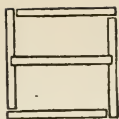


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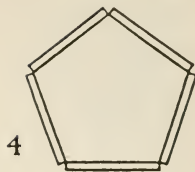


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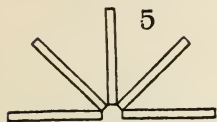


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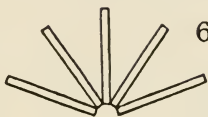
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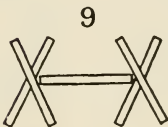
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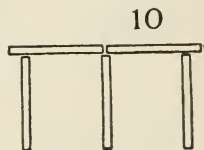
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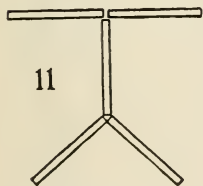
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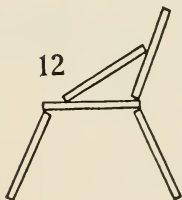
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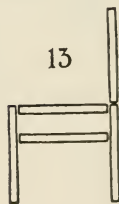
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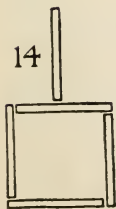
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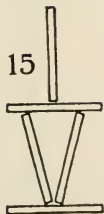
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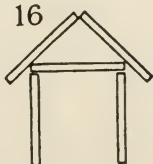
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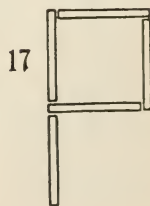
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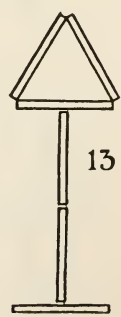
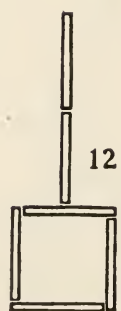
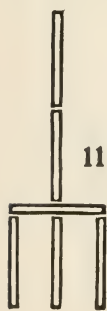
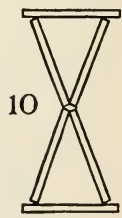
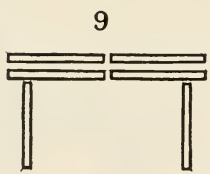
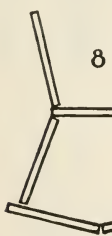
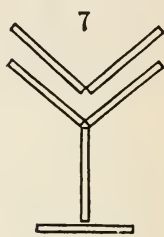
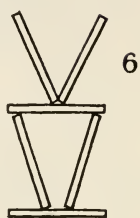
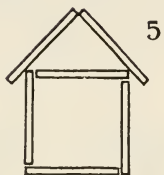
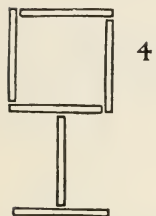
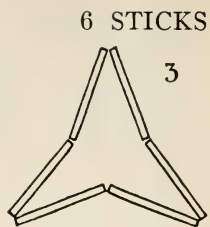
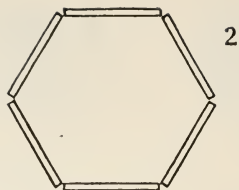
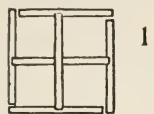


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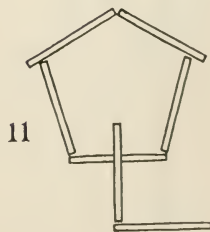
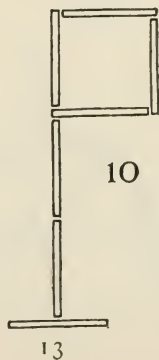
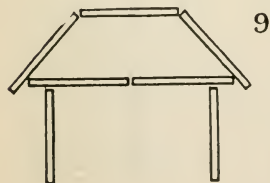
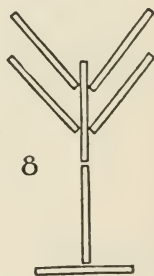
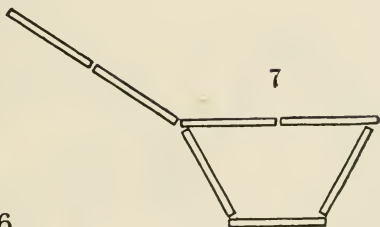
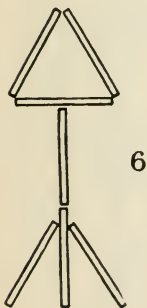
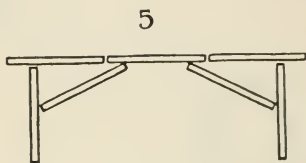
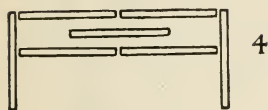
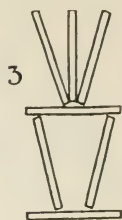
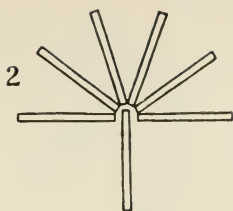
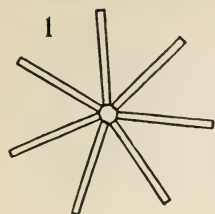
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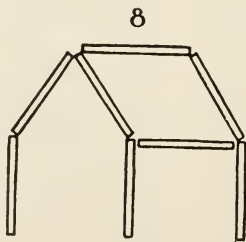
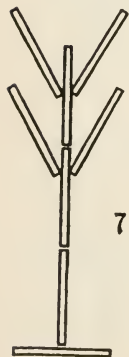
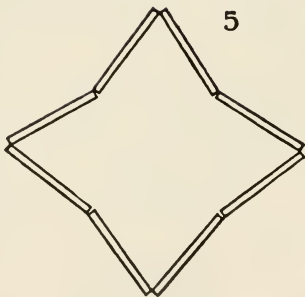
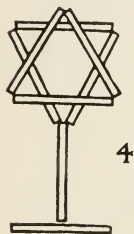
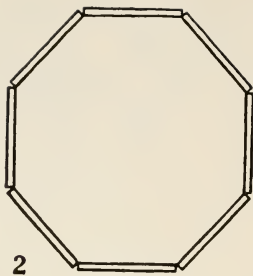
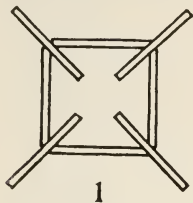


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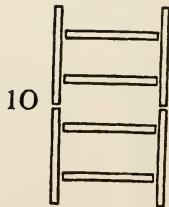
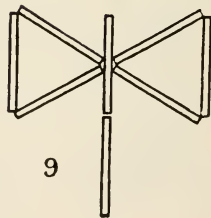
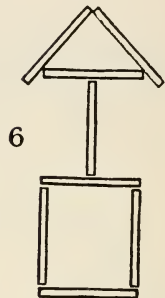
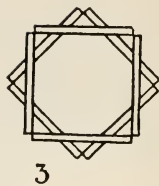
7 STICKS



EIGHT STICKS



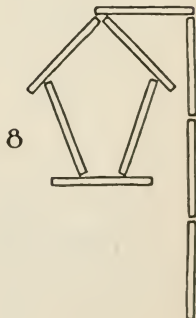
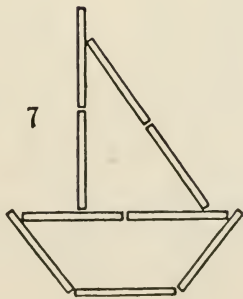
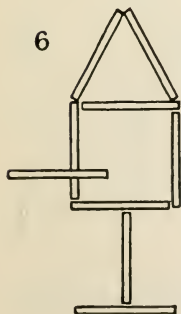
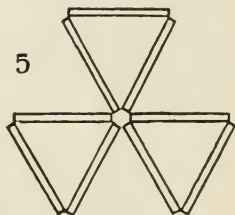
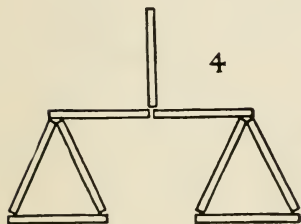
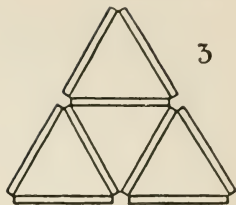
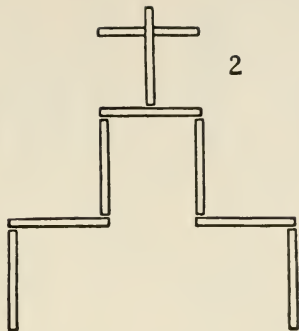
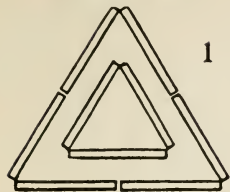
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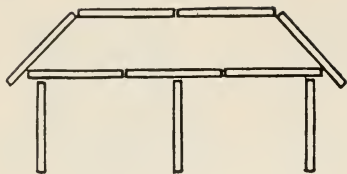


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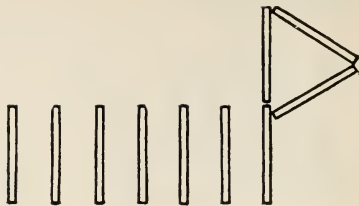


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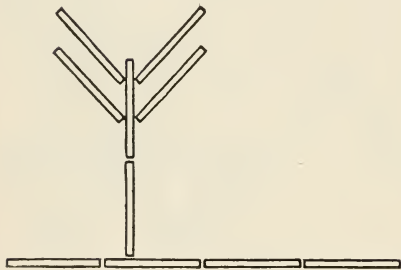


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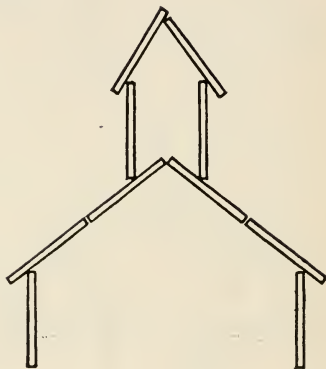
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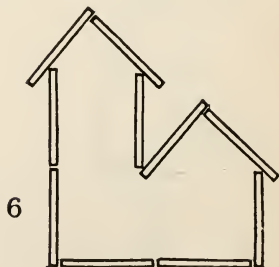
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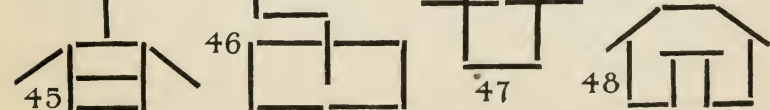
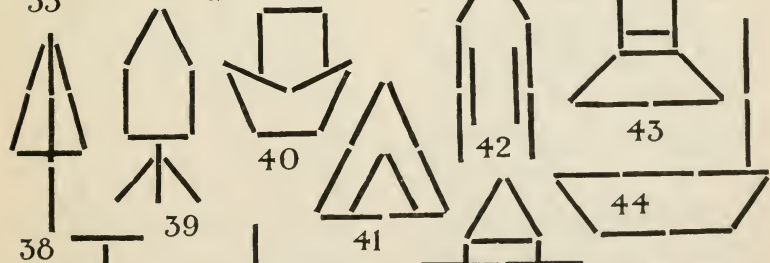
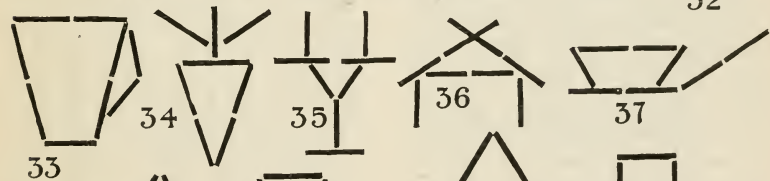
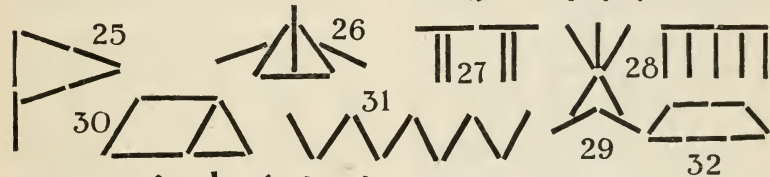
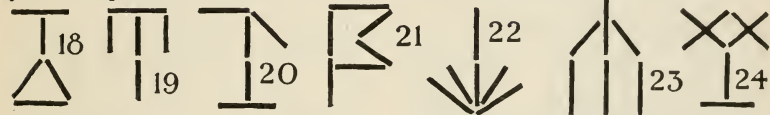
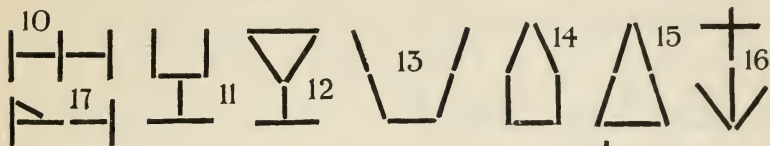
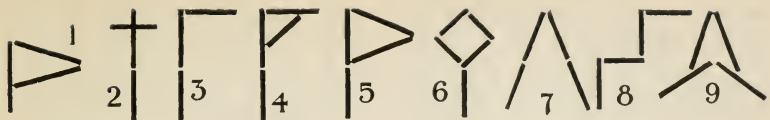
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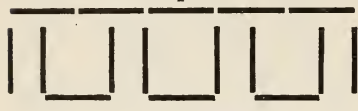




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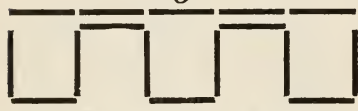
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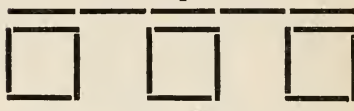
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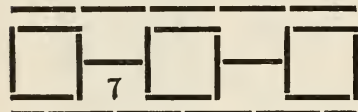
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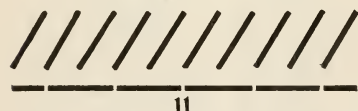
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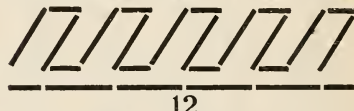
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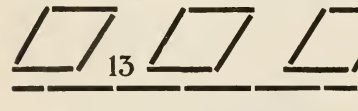
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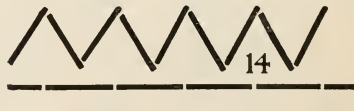
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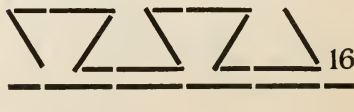
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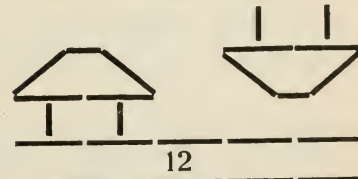
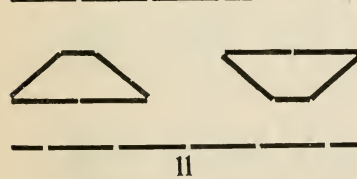
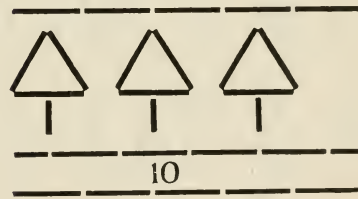
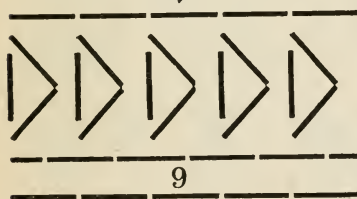
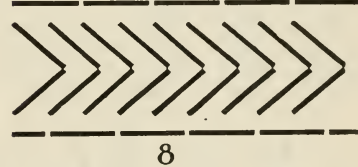
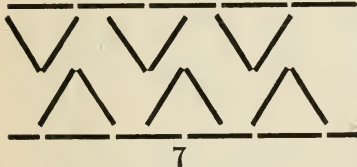
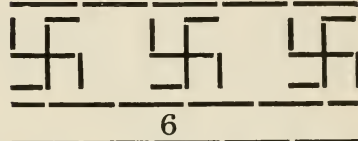
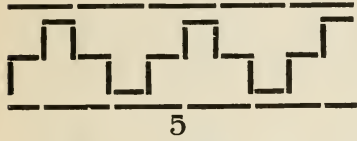
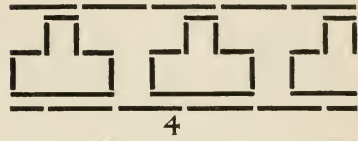
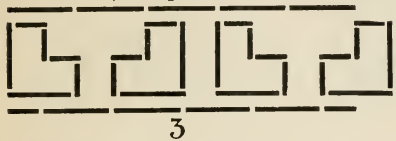
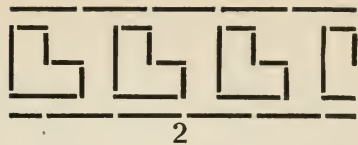
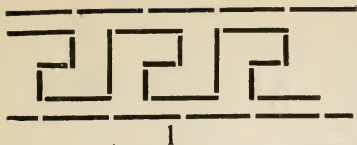
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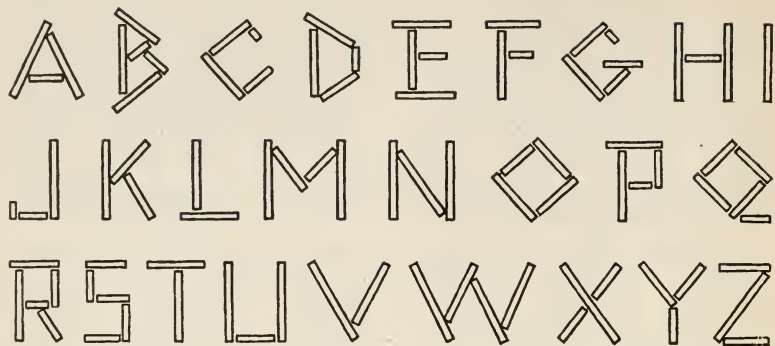


16





Alphabet to be laid with sticks



Alphabet to be drawn



Counting Exercises

•	1	ONE	I
••	2	TWO	II
•••	3	THREE	III
••••	4	FOUR	IV
•••••	5	FIVE	V
••••••	6	SIX	VI
•••••••	7	SEVEN	VII
••••••••	8	EIGHT	VIII
•••••••••	9	NINE	IX
••••••••••	10	TEN	X

## II. TABLET AND TILE LAYING

**Value.** Tablet laying differs from stick laying in that children are working with surface units instead of line units. This is an excellent exercise for training in the principles of ornamental design based on geometric forms. In fact, tablet laying is very closely related to parquetry work, and even more so to tile laying. It will be noted that some of the designs on page 24 resemble some of those of the mats on pages 55-57, which illustrates the close relation of design in these two exercises. The pupils may use whatever designs they can on pages 55-57 for their tablet or tile laying.

**Material.** For beginners the square tablets should be at least 3 centimeters on a side, and the round tiles 3 centimeters in diameter. The triangles should be component parts of the squares, or one fourth of the square in this case. Although the tablets may be made of buri or pandan, a better material is cardboard. Clay tablets, or tiles, are really the best, for then the children are actually doing real work, that is, laying tile. Both tablets and tiles may be colored in various colors, in order to add interest to the exercise and produce attractive patterns. The different shadings in the illustrations indicate the colorings.

**Suggestions.** On page 23 are models for laying square and round tablets. Other models are shown in *The Philippine Chart Primer*. Page 24 shows models for tile or parquetry work and page 25 shows models for laying square and triangular tablets or tiles. Tablet laying offers opportunity for teaching something about the comparison of shapes and sizes of surfaces. All children should learn the words *square*, *circle*, *triangle*. Show that the square has four equal sides; that the triangle has three sides; and that the circle is a continuous curved line. Show that No. 1, page 23, is a square, and let the children discover that it is four times as large as one of the tablets. Show that one of the triangles in No. 2, page 25, is one fourth of the square; that two of these triangles make the square No. 3, and therefore this square is half as large as square No. 1. In a similar manner, show how square No. 9 compares in size with No. 1, and also with No. 3. Numbers 17-22 suggest border designs. Encourage pupils to invent designs of their own. In the designs Nos. 17-19 on page 24, three colors of tiles or tablets may be used, as shown by the shadings. On page 57 is an alphabet which can be made with tablets or tiles.



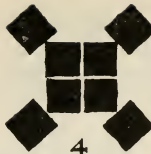
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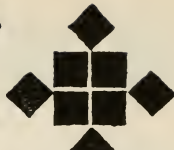
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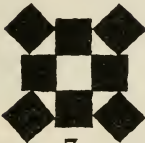
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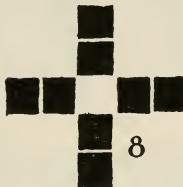
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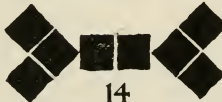
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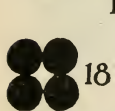
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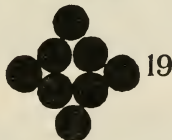
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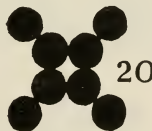
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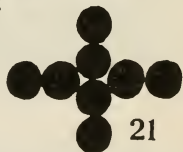
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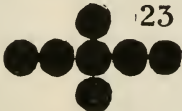
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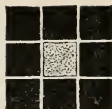




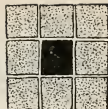
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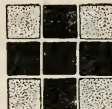
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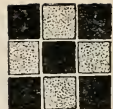
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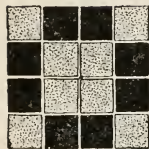
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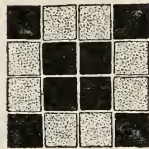
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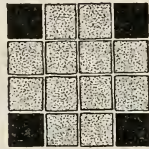
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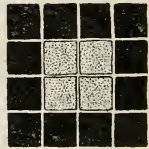
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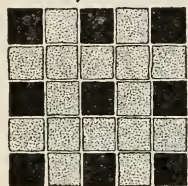
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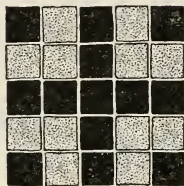
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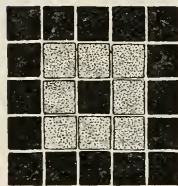
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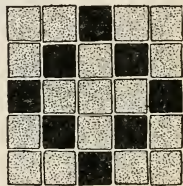
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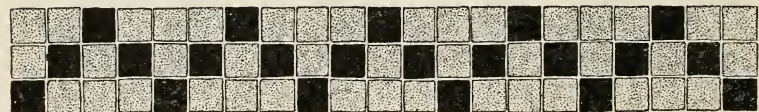
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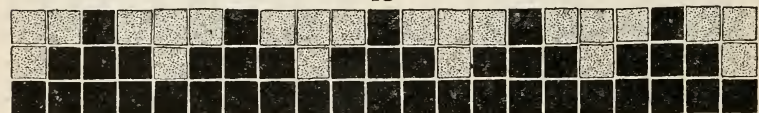
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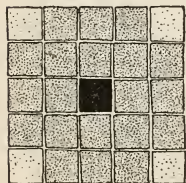
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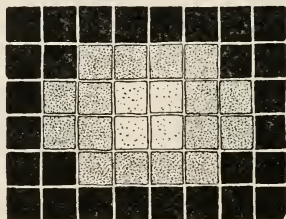
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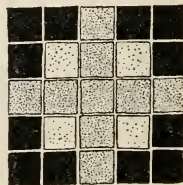
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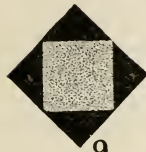
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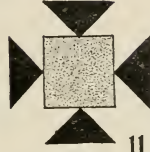
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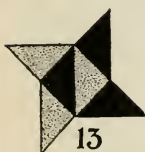
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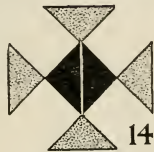
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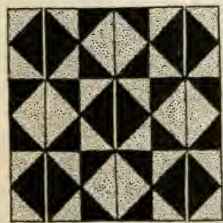
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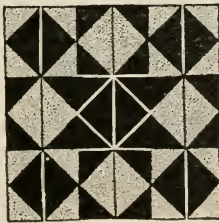
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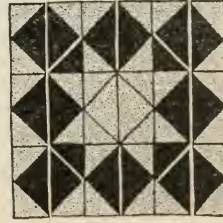
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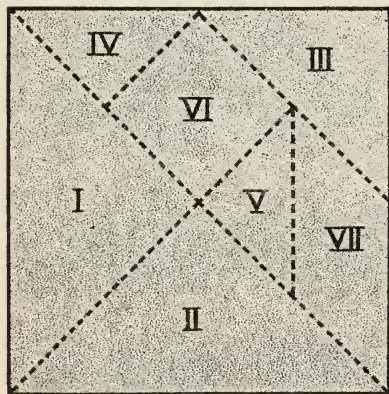


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### III. TANGRAMS

The tangram is a Chinese game or puzzle. The exercises given on the following pages are modern adaptations of the "Seven Curious Pictures of Tan," a Chinese educator, whose work was so well done that it has lasted four thousand years and is still useful. Napoleon at St. Helena found amusement in tangrams, and Gustav Doré and the American engraver Sartain remembered them as a valuable part of their education.

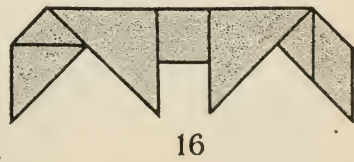
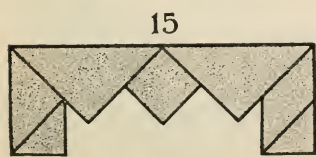
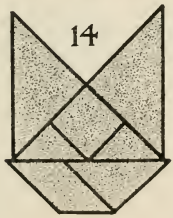
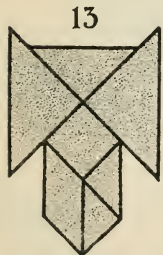
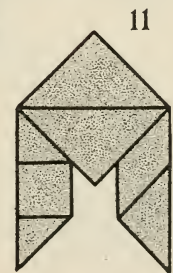
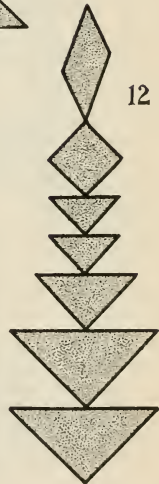
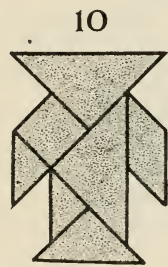
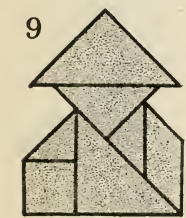
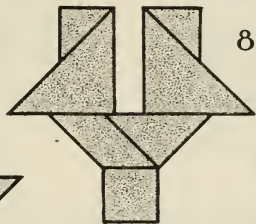
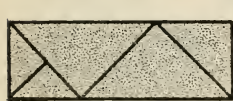
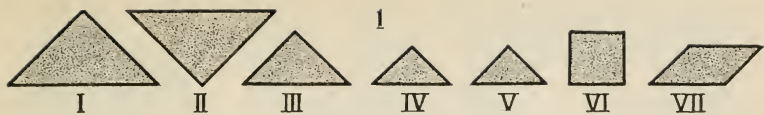
**Value.** Tangram exercises are probably rather difficult for young beginners, since it requires considerable skill to reproduce the illustrated forms. However, with a little practice the exercises will become more and more fascinating. One of the chief values is that the attention is focussed upon the details of the illustration. It trains the young mind for careful reading and studying of working models. Moreover, the child's inventive power will be stimulated when he begins to realize the wide range and great number of forms that can be made from the seven pieces.

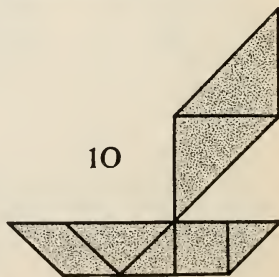
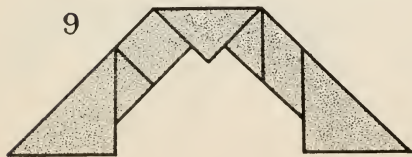
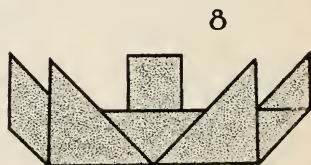
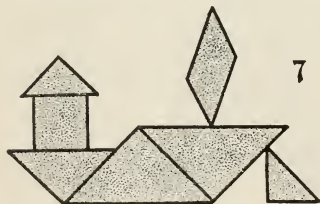
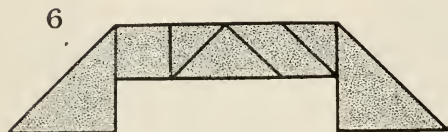
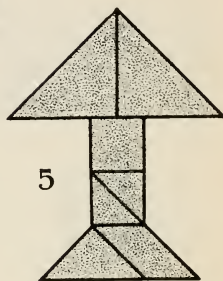
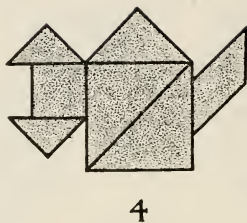
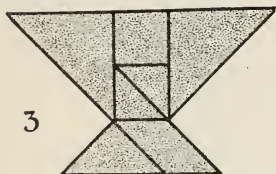
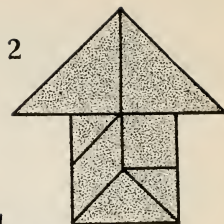
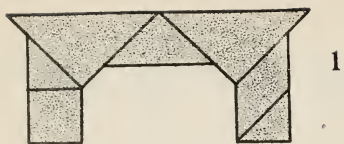


Stimulate invention of original design. Like tablet laying, the laying of tangrams has a bearing on tile laying, mosaic work, and parquetry.

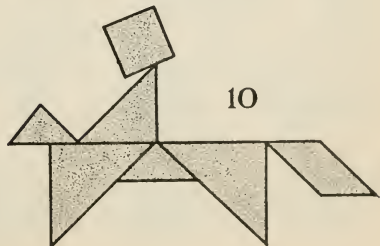
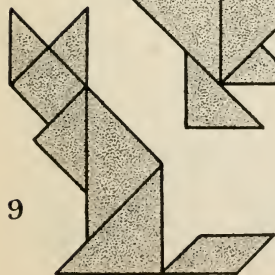
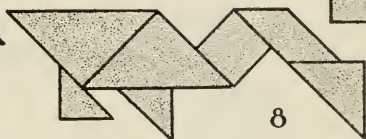
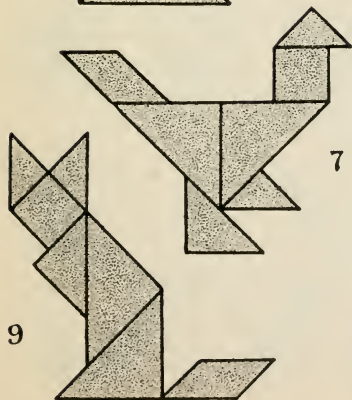
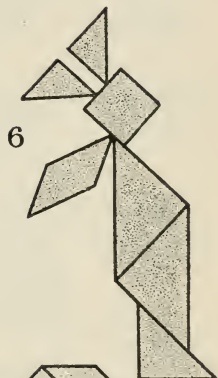
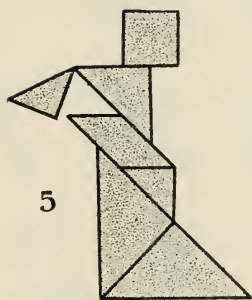
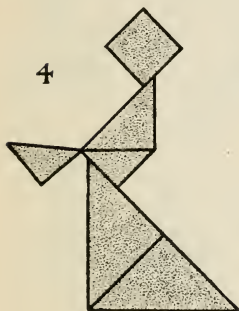
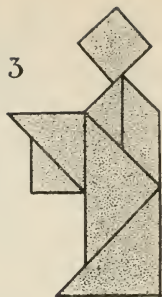
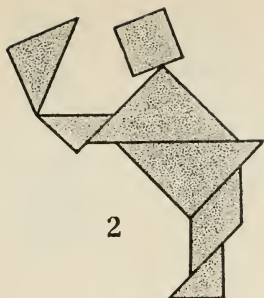
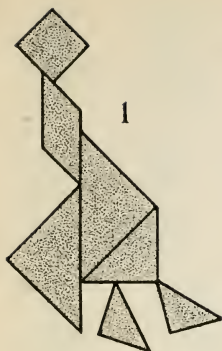
**Material.** Each child should have his own tangram, which should be prepared for him by older pupils. Probably the best material is stiff manila paper or cardboard. To make the tangram, mark off a 10 centimeter square, as shown by the dotted lines in the illustration, and cut straight edges along these lines. Care should be taken to have the square and

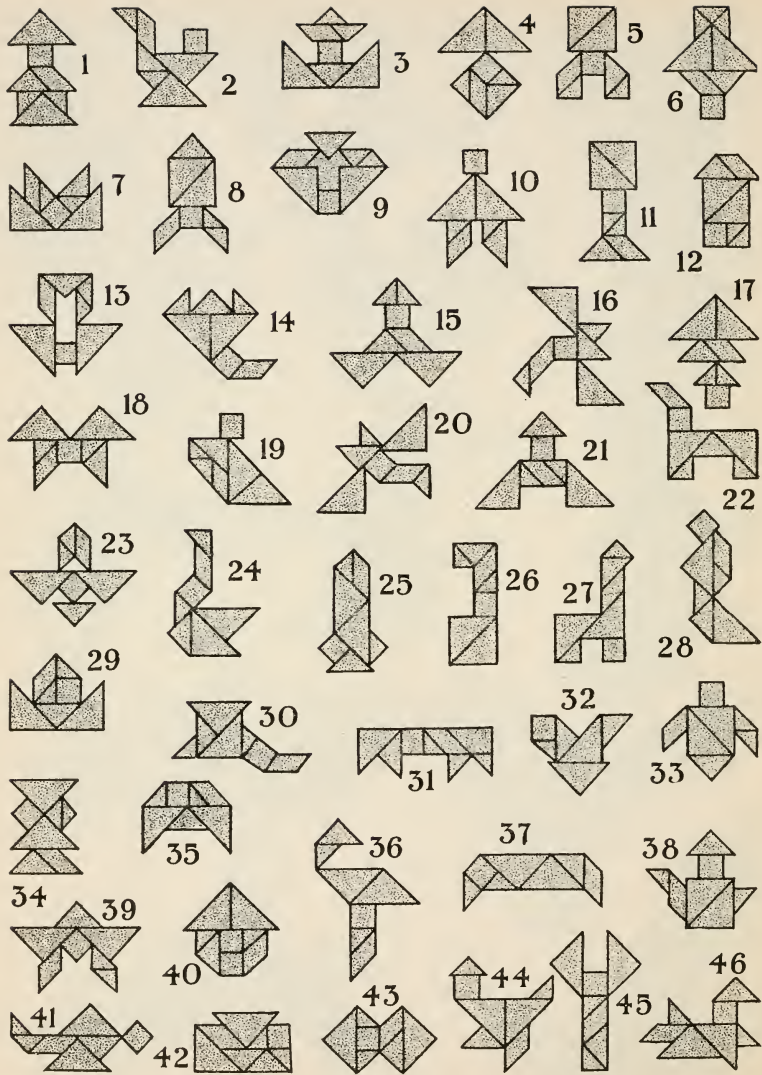
markings accurate and the cuttings even: otherwise the pupil will not be able to make the forms as illustrated.











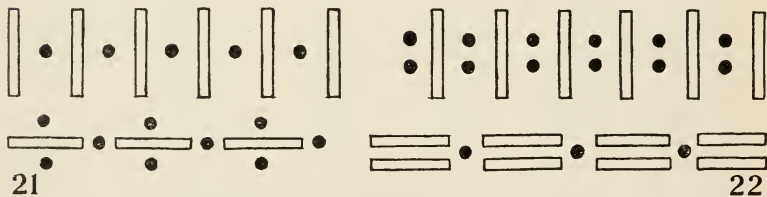
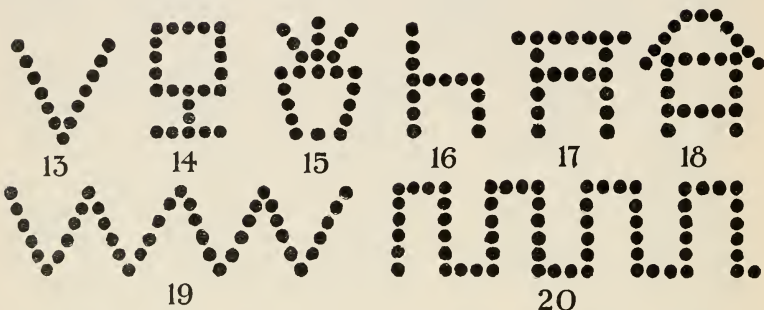
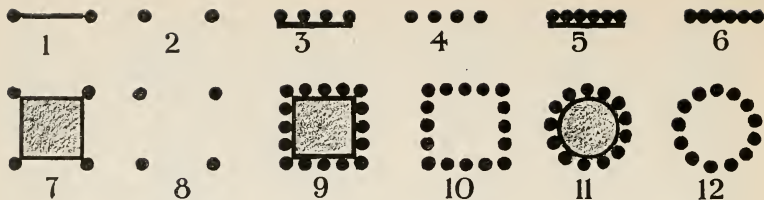
#### IV. SEED AND SHELL WORK

**Value.** In these exercises the children are playing with points which are placed to form lines and surface outlines. The children should have some practice in stick and tablet laying before they attempt seed or shell placing. Seed or shell placing offers excellent practice for developing finger dexterity and for training the eye. It is also possible to teach a few geometric principles, *i.e.*, that it takes two shells to indicate the direction of a line; that it takes at least three shells to outline a surface. Shell placing is a good preparation for perforating and sewing. The stringing of beads in pleasing designs develops artistic judgment in the proper arrangement of colors and shapes and offers very entertaining counting exercises.

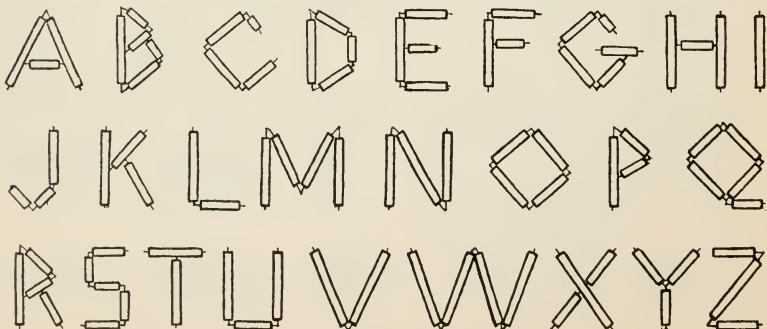
**Material.** Almost any kind of seed may be used, provided it is not too small; the use is specially urged of the beautifully colored seeds that grow so abundantly in many localities. Glass beads, peas, beans, lentils, and the seeds of maize, squash, pumpkin, watermelon, chico, etc., are good to use. Shells and pebbles that abound on seashores are very good, too, provided they are of somewhat regular sizes and uniform shapes. Cubes, oblongs, and even rosettes may be cut from pith like the camoting cahoy; such forms offer pleasing variety when strung with seeds and beads as shown on page 33. Sections of hollow straw also may be used.

**Suggestions.** First let the children lay a stick; then place a seed or a shell at each end (page 32, No. 1); then remove the stick and let the children see that the two shells represent a line (No. 2). Again lay the stick, lay shells along its length (No. 3), then remove the stick, and there is a line of shells (No. 4). Numbers 5 and 6 are done in the same way. Now let them lay a square tablet, placing a shell first at each corner (Nos. 7 and 8), then along the sides (Nos. 9 and 10). Handle the circle as shown in Nos. 11, 12. Other forms may be outlined, fruits, books, hats, sandals, etc. Later let the children lay outlines of forms without laying down the form. Numbers 13-18 show how stick-laying models look when laid with shells; let other pictures on pages 8-19 be made. Other pages that suggest models for seed and shell laying are 35, 36, 38, 39, 61, 62.





Alphabet made by sewing straws on leaves





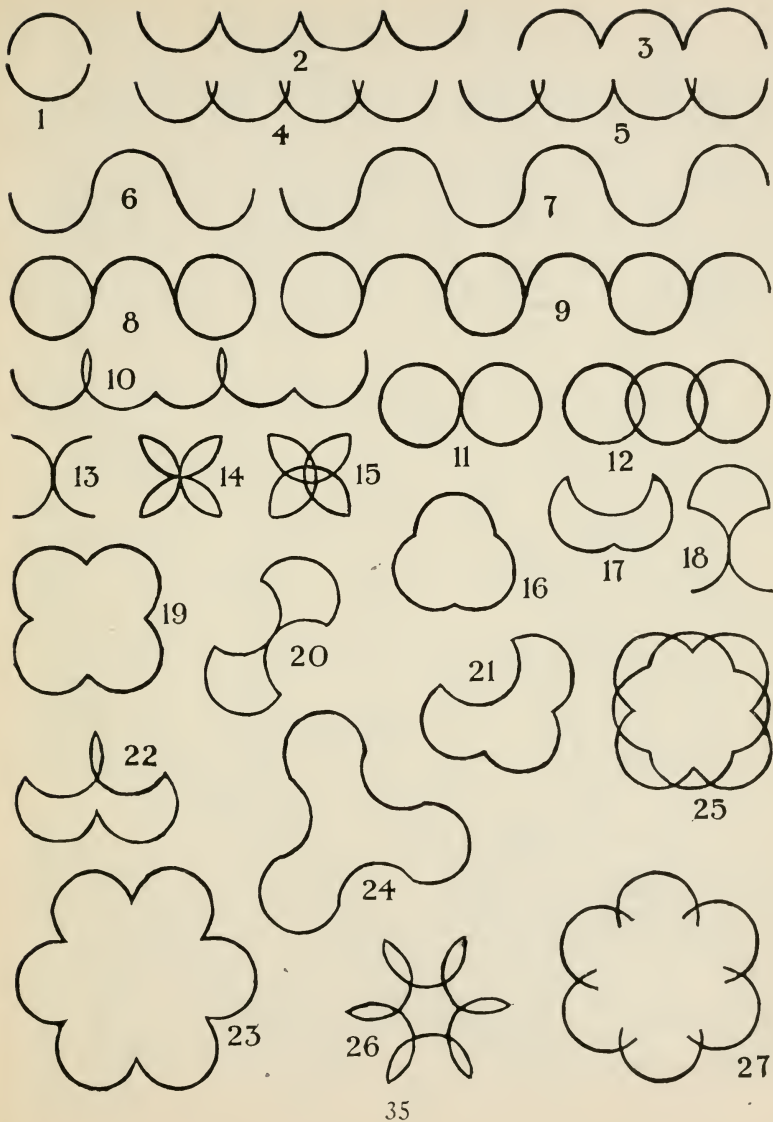
## V. GRASS AND STRING ORNAMENTS

**Value.** Here the pupils are using curved lines. The building of designs from units of curved lines (page 35) is good preparation for design in needlework, especially for appliqué figures, shapes of doilies and table covers, and scalloped edges. The outlining of forms with wet string is particularly a good drawing exercise.

**Material.** The best materials for the exercises on page 35 are some of the grasses which can be bent into curved lines and will retain their shape. Some grasses that are sticky can be moistened and attached to dried leaves or paper, and the designs can be preserved. For the exercises on page 36 use wet string. Take a string about 70 centimeters long, tie the ends together, and soak it in water.

**Suggestions.** Let the pupils make from grasses curved lines representing half circles (page 35, No. 1). These units can be used to form border designs, similar to scalloped edges, both on straight edges (Nos. 1-10), and on curved or circular edges (Nos. 16, 19, 23-27). Some of the figures also may be used as ornamental patterns for centerpieces. The children will be interested to see how this one unit can be used in making a great variety of designs. Show how No. 17 is made from No. 16, by simply turning one of the units with the curve inside; No. 18 is made by turning two of the units with the curve inside. Show in the same way how Nos. 20, 21, and 22 are developed from No. 19; and No. 24 from No. 23. Stimulate original designing, by letting the pupils change other forms in a similar manner.

The exercises on page 36 are made with the wet string. First let the square be laid. Let the pupils lay the wet string on the desk and with a stick or pencil work the string into shape. Number 2 is made from the square by pushing in the two sides; No. 3 by next pushing in the top and bottom edges. Numbers 5-8 show developments in working with a circle. Numbers 9-28 suggest simple forms for outlining. Let the pupils outline others. An interesting and profitable exercise is for the child to draw these outlines in sand without lifting the stick off the ground. A somewhat similar exercise was the favorite amusement of Dr. Rizal in his youth.





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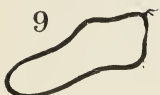
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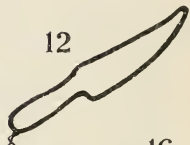
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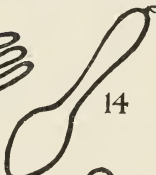
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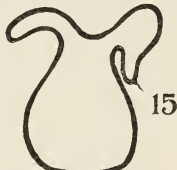
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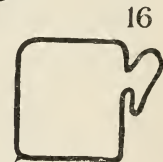
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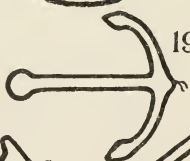
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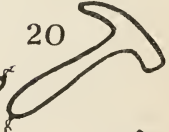
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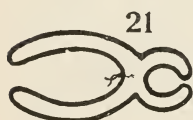
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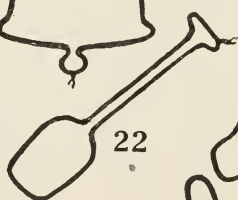
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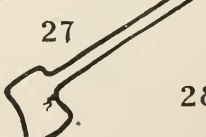
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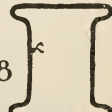
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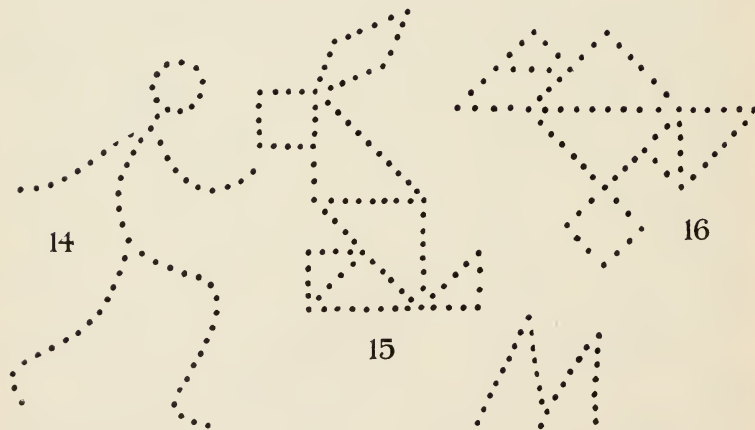
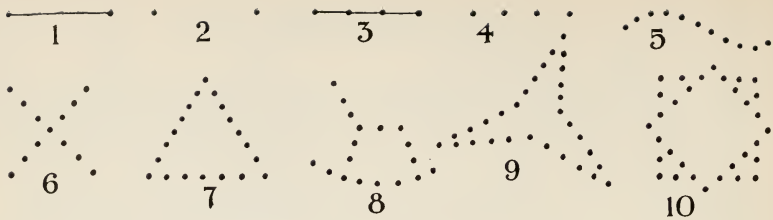
## VI. PERFORATING

**Value.** This exercise consists in perforating, or punching, holes into leaves or paper. Shell placing is good preparation for perforating; in the former, the outlines are formed by shells or seeds which are easily placed aright if not properly placed at first; in perforating, it is not possible to correct a misplaced perforation or hole. Perforating is equally as valuable as shell placing for training hands, fingers, and eyes. It is good preparation for outline drawing, and lets the children make something that they can keep. They will enjoy holding their perforated outlines to the light to see the light sparkle through the holes. Let the children place their perforation on a board and, scattering sand on it, rub the sand through the holes. The perforated picture will appear outlined in little dots of sand. This is an application of transferring needle-work patterns on cloth.

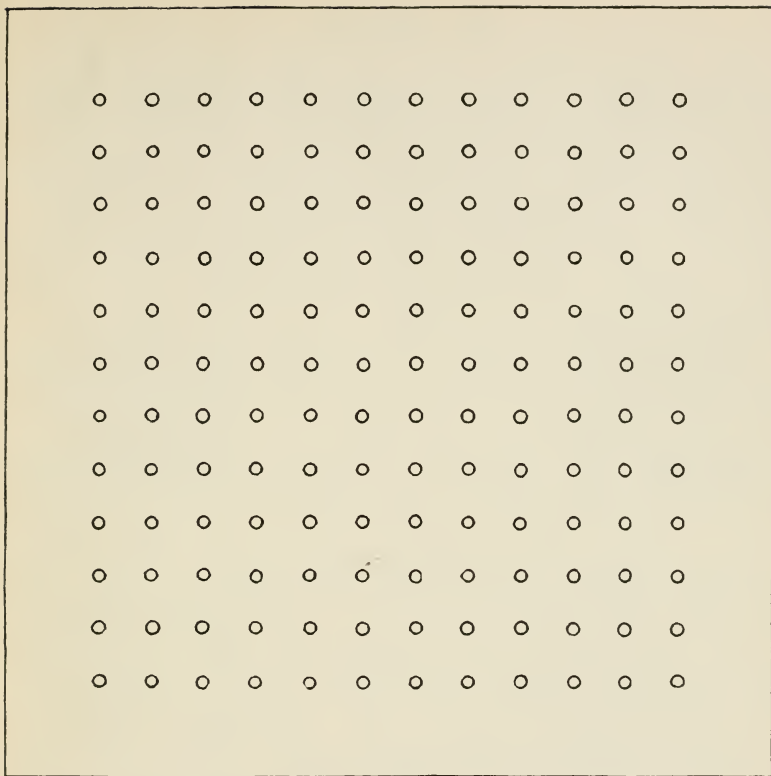
**Material.** Outlines may be perforated on leaves or paper with a sharp needle mounted in a handle, or with a pointed stick.

**Suggestions.** First let the pupils lay down a stick and perforate at each end. Then let them lay down the stick and perforate along its length (page 38, Nos. 1-4, Nos. 6-10). Show how stick forms may be perforated, and let the pupils perforate others, shown on pages 8-10. Numbers 11-13 suggest how the grass and string ornaments can be done by perforating; let the children do the forms on pages 35, 36. Numbers 14-16 show the application of perforating to the skeleton forms given on pages 61 and 62, and the tangrams on pages 27-29. Let the pupils lay down forms like square or round tablets, books, leaves, etc., and perforate around them. The teacher may draw simple animal (page 38) or plant forms on leaves or paper, which pupils can outline by perforating along the pencil lines.

**Perforated cards.** Every teacher should have a set of perforated cards of cardboard. One of the cards should be 20 centimeters square with 12 rows of 12 perforations each, the perforations being 1 centimeter apart, as shown on page 39. To make other cards like this, place the perforated card on the cardboard, hold it firmly so that it will not slip, and with a pencil mark through each hole. Older pupils or monitors can thus use these cards to mark papers or leaves for children to use in their sewing (pages 41, 42, 44). Another card for marking papers or leaves for cross-stitching should be made. Let this card be 25 centimeters by 10 centimeters, with 10 rows of 30 perforations each, 7 millimeters apart.







Alphabet made by perforating leaves

A B C D E F G H I J K L M

N O P Q R S T U V W X Y Z

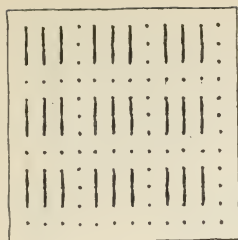
1 2 3 4 5 6 7 8 9 0

## VII. SEWING

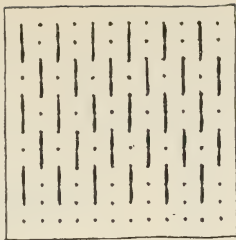
**Value.** Sewing naturally follows perforating, and may be done in connection with it. It may be done also with stick laying. Sewing develops hand and finger skill for needlework. By using the perforated cards, the children are trained in the essentials of needlework, where it is necessary to count threads and stitches. The holes guide the children in making their outlines and thus the sense of form is deepened. By using colored fibers or threads, and coloring the forms outlined, a sense of color and feeling for harmony of colors is developed and strengthened. The sewing of freehand outlines, as shown on page 43, is closely related to drawing.

**Material.** Sewing may be done on sewing cards or on leaves or paper which have been marked off with dots by means of the sewing card (page 37). Colored yarns, raffia, or other fibers may be used. Every child should have a perforated card, as shown on page 39, with holes large enough through which to sew with raffia.

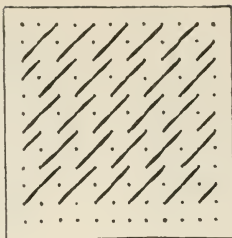
**Suggestions.** The easiest way for children to begin sewing is first to sew the outlines that they have already perforated. First let them sew over and under around the form, making a broken line as in No. 1, page 42; then by sewing around the second time the line is closed, as in No. 2. The sewing should be neat on both upper and under sides. The first sewing had better be done on leaves or paper, marked off in dots with the sewing card. On page 42, Nos. 3-5, is suggested the sewing of geometric and border designs; this suggests the sewing of stick-laying designs, as illustrated on pages 8-19, to which children should be referred. The suggestions and illustrations for perforating apply to sewing as well. Numbers 6-11, page 42, are animal forms sewed on dotted lines or paper. On page 43 are other forms for freehand sewing. The outline forms may be appropriately colored, as shown by the shading in the illustrations. Page 44 gives designs for cross-stitch sewing, which can be done on leaves or paper marked with dots. It may also be done on cloth, woven with a checked pattern. On page 41 are suggestions for all-over surface decorating, which may be done on sewing cards or dotted leaves or paper. Other pictures which will offer models for sewing are found on pages 59-62 and 64-71.



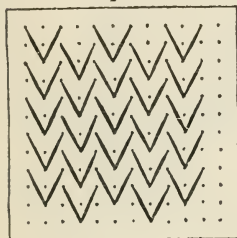
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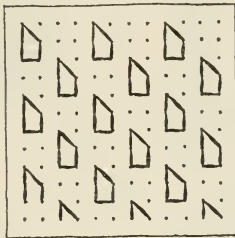
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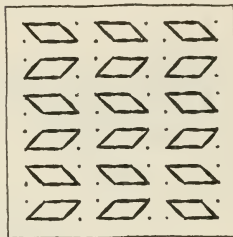
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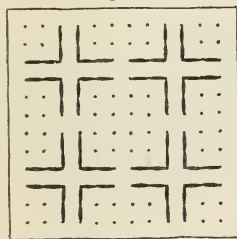
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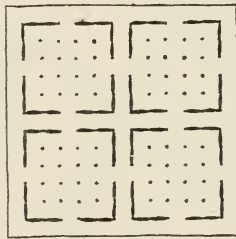
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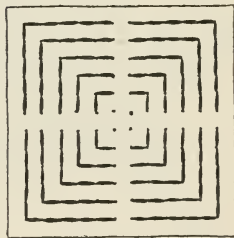
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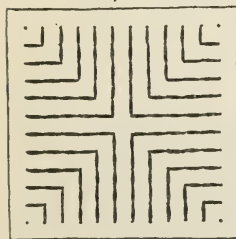
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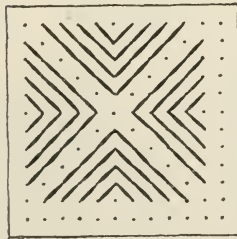
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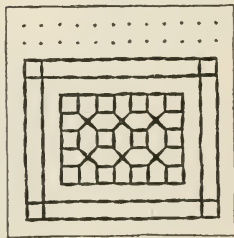
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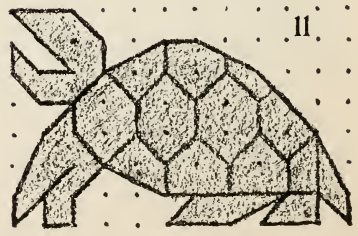
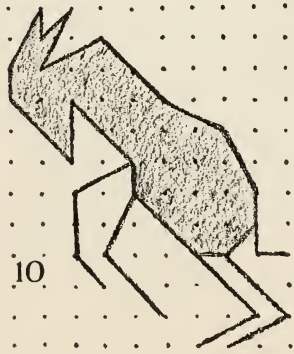
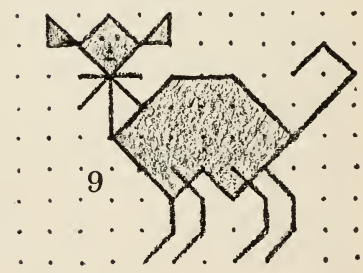
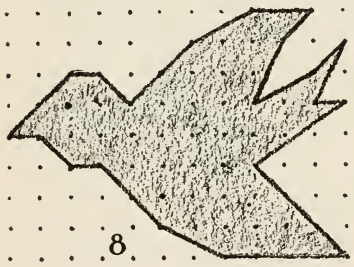
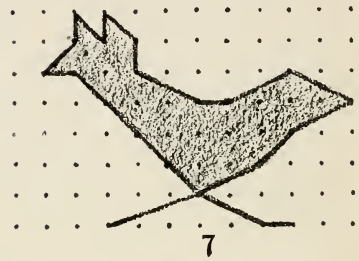
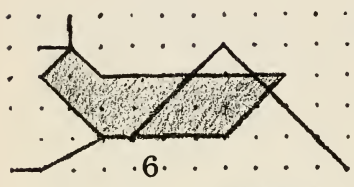
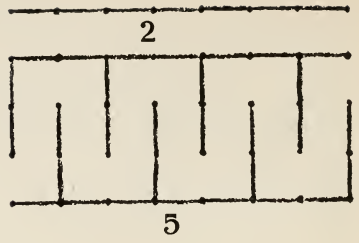
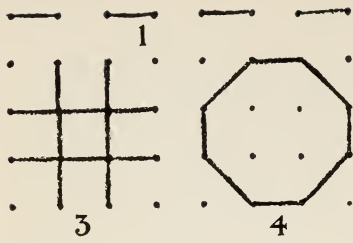
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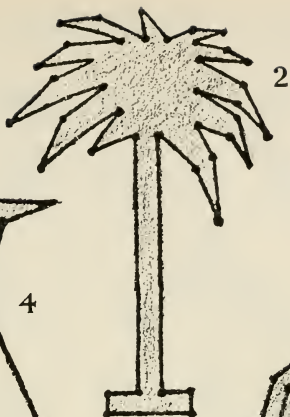


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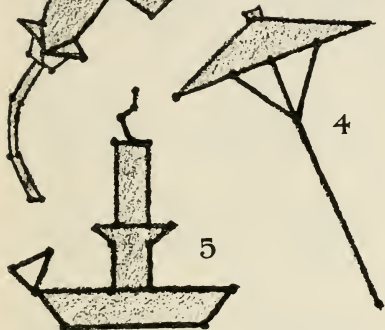
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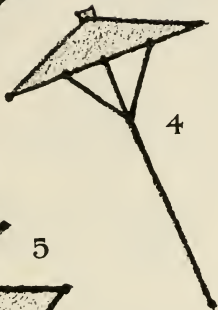
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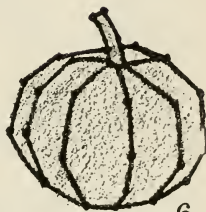
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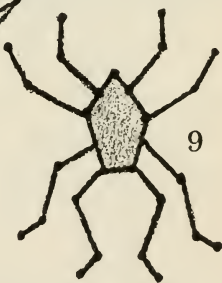
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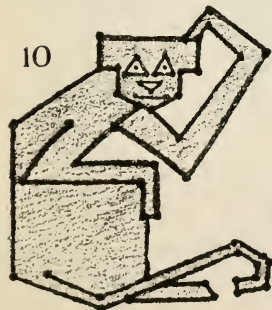
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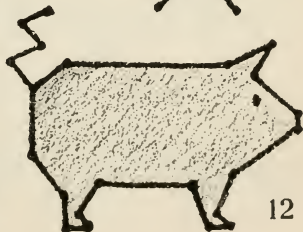
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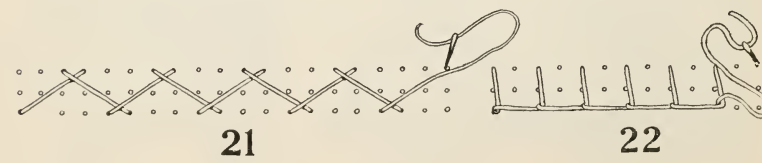
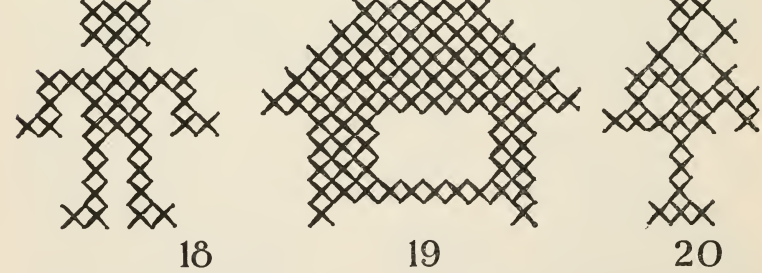
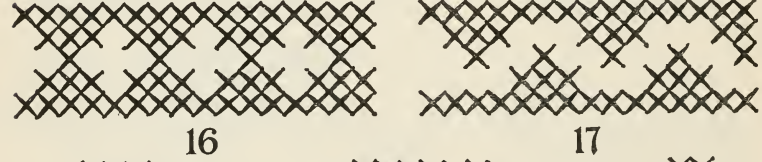
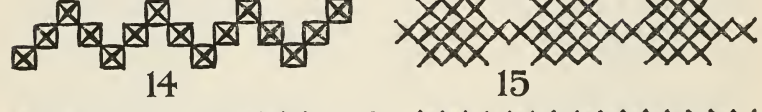
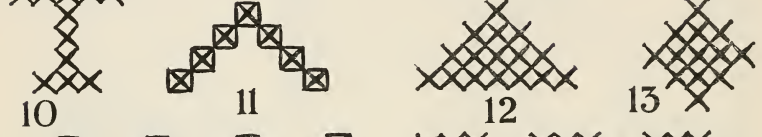
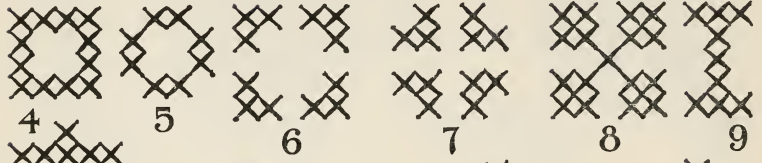
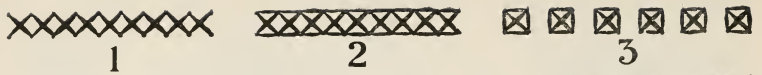
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## VIII. SPLINT WEAVING

**Value.** This exercise prepares the children for hand weaving. It is interesting, because the children can lift the woven forms from the table. Splint weaving develops skill in both hands.

**Material.** Use bamboo or similar material cut into splints about 25 centimeters long, 1 centimeter wide, and not over 2 millimeters thick. Colored splints add interest to the exercises. The coarser material for weaving, sawale and matting, may be taken from old sawale, which has been pulled apart.

**Suggestions.** Do not let the children try these exercises until they have had some practice in handling material. Let them lay the splints in their order for weaving figure No. 1, page 46, as suggested by the letters *a, b, c, d*. Show how *d* locks the figure so that it can be lifted. Numbers 2 and 3 are formed from No. 1, by shifting certain splints. Show that No. 4 cannot be lifted, but No. 5 can, and this can be made into Nos. 6, 7, and 8. Show also how when No. 9 has been woven, Nos. 10-14 are easily formed by shifting the splints. Similar changes can be made in other figures, which the pupils should try to discover. Encourage the invention of new designs. Care must be taken that the pupils do not strain their eyes. On page 49 are shown seven kinds of sawale weaves, and the wattling weave. The illustrated exercises below suggest a good way to teach some words and phrases useful in giving directions for industrial work; the teacher can offer others.

| standing      — lying      / leaning to the right      \ leaning to the left

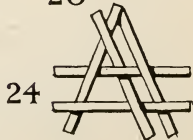
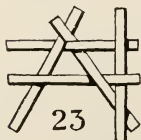
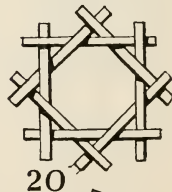
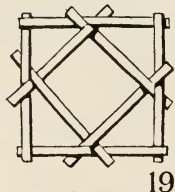
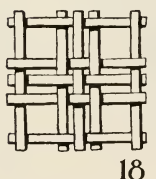
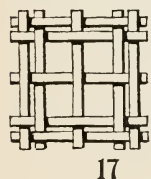
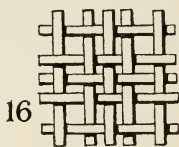
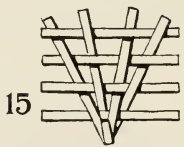
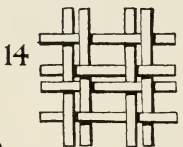
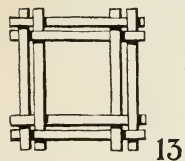
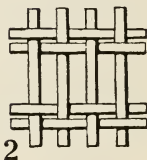
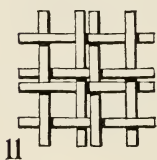
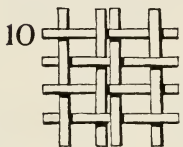
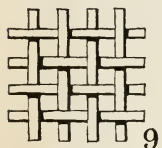
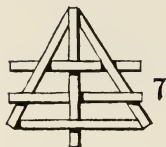
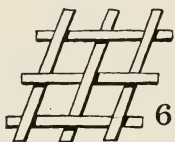
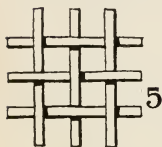
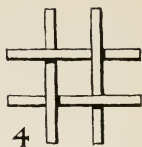
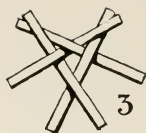
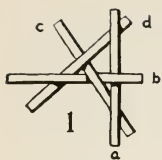
└─┘└─┘└─┘ joined at the bottom      ┌─┐┌─┐┌─┐ joined at the top

|| = side by side      — — — end to end      X + crossed      △ triangle

└─┘ right angle      < acute angle      \ obtuse angle

┌─┐ over one and under one      ┌─┐┌─┐ over one and under two      ┌─┐┌─┐ over two and under two



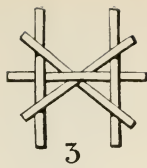




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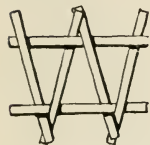
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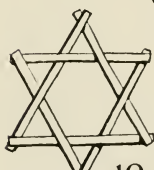
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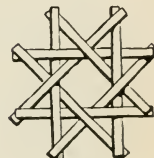
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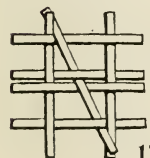
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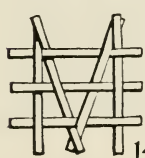
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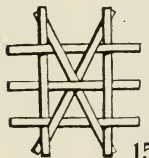
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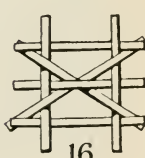
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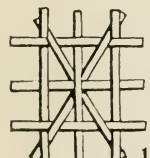
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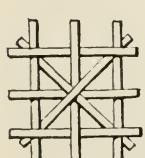
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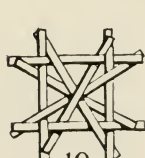
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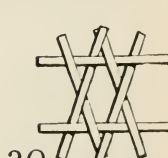
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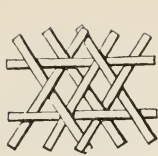
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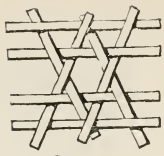
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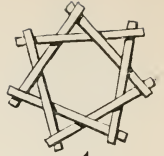
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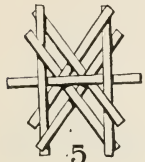
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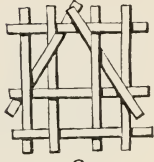
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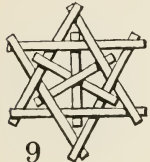
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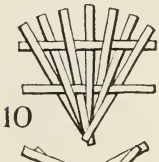
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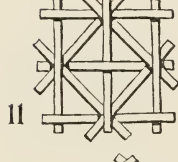
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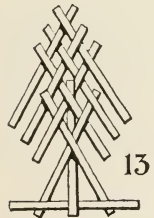
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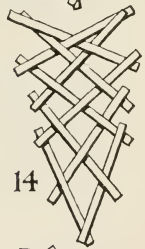
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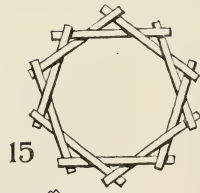
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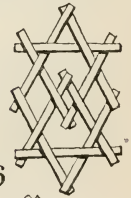
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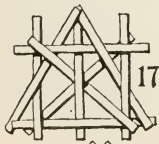
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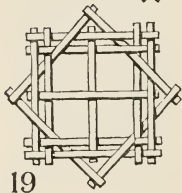
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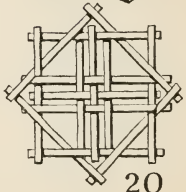
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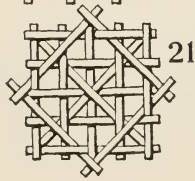
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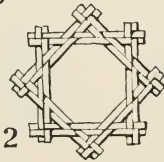
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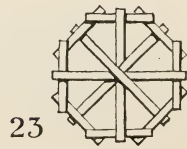
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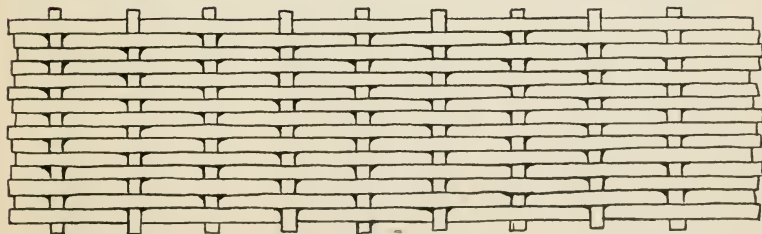
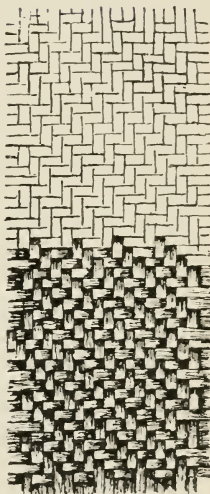
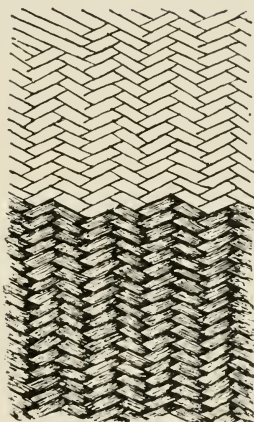
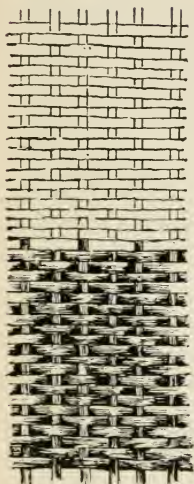


23



24

## Sawale Weaves



## Wattling

## IX. BURI INTERLACING

**Value.** The values of this exercise are similar to those of splint weaving. Buri interlacing gives special practice in the turning of corners as applied to the weaving of mats (*Industrial Studies and Exercises : Teachers' Edition*, pages 16, 175, and Chapter XIV). It also trains in accurate measuring.

**Material.** Use buri or lupis strips of about 1 centimeter wide and 25 to 35 centimeters long for the first exercises; some of the advanced exercises require longer strips. The strips may be colored. Strips unwoven from old sacks and mats may also be used by beginners.

**Suggestions.** In connection with the first folding exercises a good opportunity is offered to teach a few arithmetic principles. Let each child fold his strip exactly in the middle. Show that now the folded strip is half as long as formerly; that each strip has two halves; that the two halves of each strip are equal; that one half of a long strip is longer than one half of a short strip. Do the same in teaching one third. Let the strips be folded into halves, then fold again in the middle. Unfold and count the divisions made by the folds. There are four; each is called one fourth. The fourths are all equal. There are two fourths in each half.

To fold a right angle, let the children fold around a corner of their books. Acute and obtuse angles may first be laid with sticks to serve as a model and guide for folding. In folding outlines like triangles, squares, etc., the children should first measure their strips to ascertain where the folds should come. It will help the children to lay different kinds of triangles and oblongs in sticks and to use the sticks for measuring on their strips. It will require considerable skill to get good simple outlines. Another helpful method will be to let the children draw triangles in sand, and fold around the drawings. Numbers 2, 3, 5, 7, 8, etc., on page 51, show how forms may be interlaced. Using strips of two colors will add interest. The folding of corners, as used in the diagonal mat weave, is shown in Nos. 7-11, page 53.



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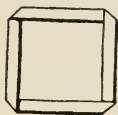
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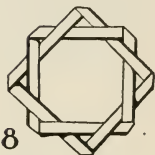
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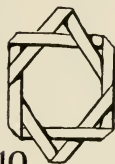
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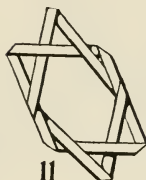
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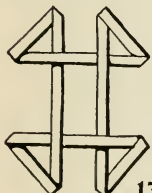
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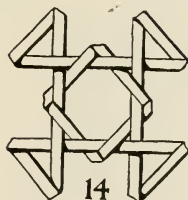
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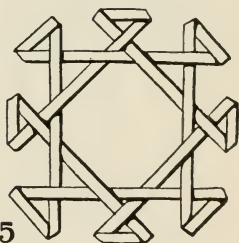
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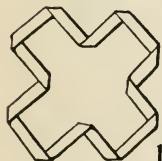
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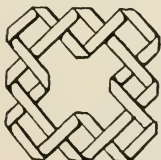
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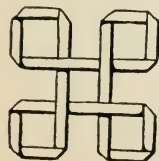
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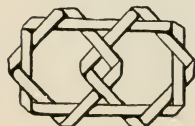
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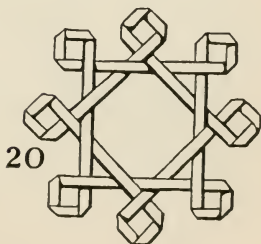
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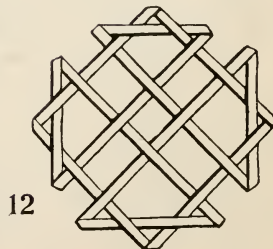
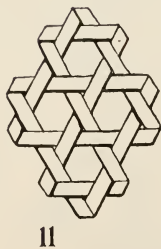
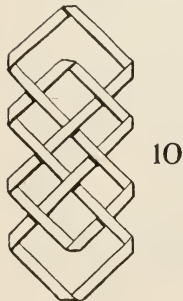
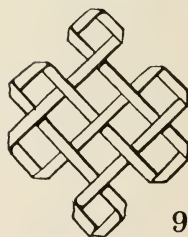
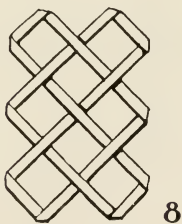
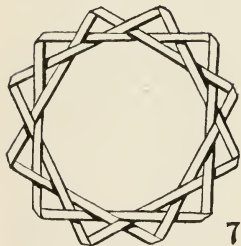
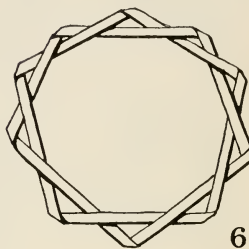
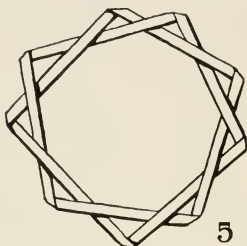
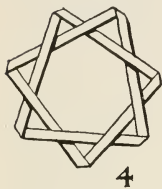
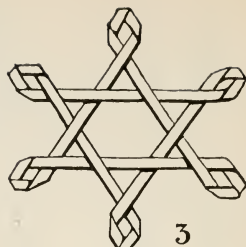
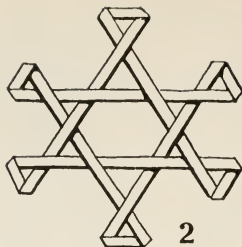
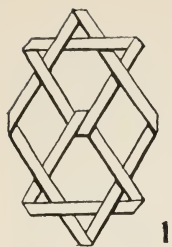


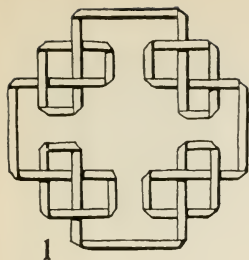
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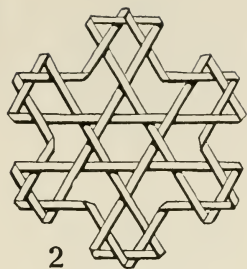
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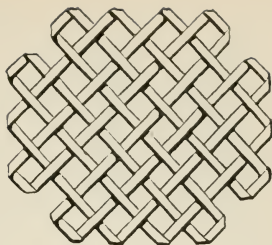




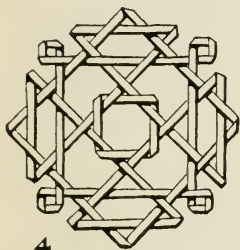
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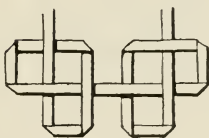
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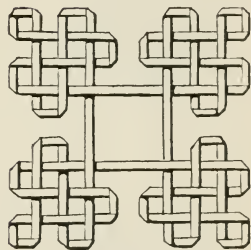
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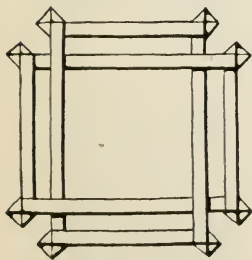
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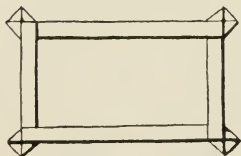
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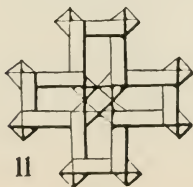
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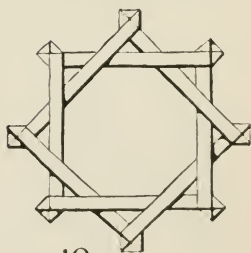
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## X. MAT WEAVING

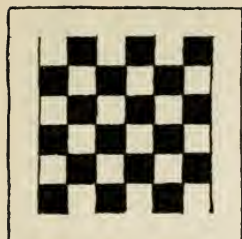
**Value.** This exercise is good training not only in simple principles of hand and loom weaving, but also in formal designing.

**Material.** The first weaving should be done on mats of leaves or paper of six strips, as described in *Industrial Studies and Exercises: Teachers' Edition*, page 170. Pandan, buri, and similar fibers may be used for the woof strips. Let the woof and warp strips be 2 centimeters wide. Later, weaving may be done on mats with 12 strips, as shown on page 56. In these mats the strips, both warp and woof, may be narrower, about 1 centimeter wide. The woof strips had better be a different color from that of the warp strips so that the designs will show clearly. The first exercises should be done with woof strips of one color; later, two colors of strips may be used in weaving.

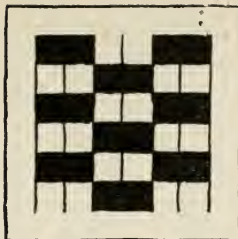
**Suggestions.** In mat weaving, as in sewing, the children should be taught the value of accurate counting. Let the children study the designs illustrated and count the strips. If a mistake is made, let them find it by comparing their work with the pattern and counting the strips in each. After having woven over two and under two, the children should note that they have woven through four strips; thus they learn addition; they will also see that of the six strips, two are left, and thus they learn subtraction.

An excellent drill is to let the class weave in concert, each one saying "over one, under one" as he weaves. After each strip is woven in, let the pupils hold up their work for the teacher's criticism and suggestion. Also, the teacher may dictate a design, without letting the children know what they are to weave. The pupils are to weave as the teacher dictates, neither faster nor slower. Some of the patterns for tablet laying, page 24, may be woven. On page 51 is an alphabet which shows the forms of letters for weaving names, sentiments, etc., into mats. Numbers 1-3 may be used as borders or all-over designs.

When the children have had sufficient practice in weaving with the mat loom, let them weave with warp strips attached at one end, as described in *Industrial Studies and Exercises: Teachers' Edition*, pages 171, 172. After that, let them weave with the warp strips entirely unattached. For suggestions for making things from mats, see *Industrial Studies and Exercises: Teachers' Edition*, pages 110, 171.



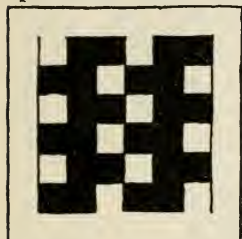
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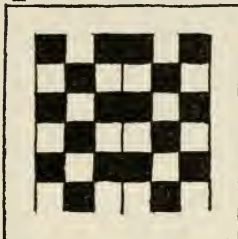
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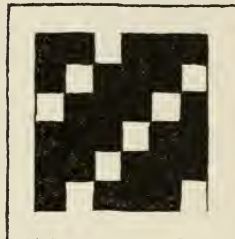
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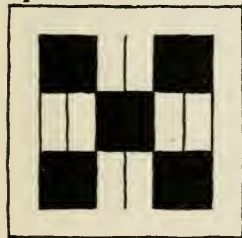
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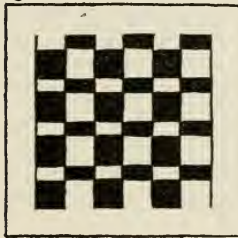
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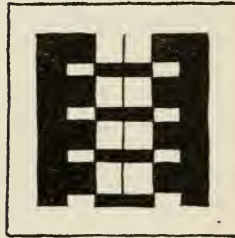
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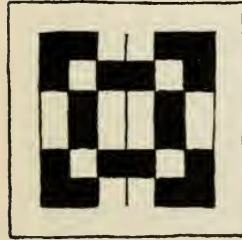
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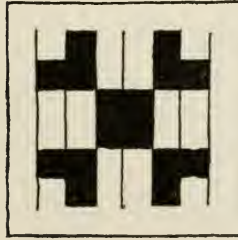
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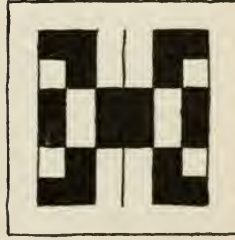
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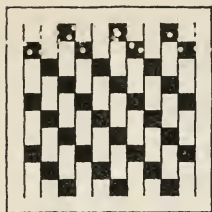
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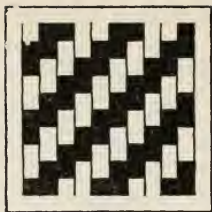
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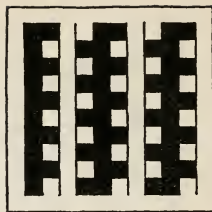
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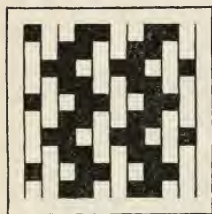
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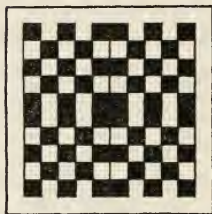
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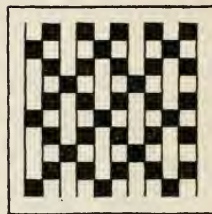
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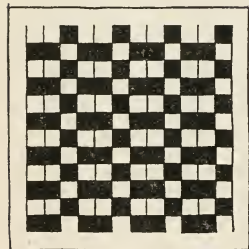
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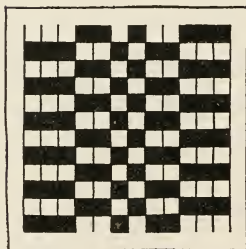
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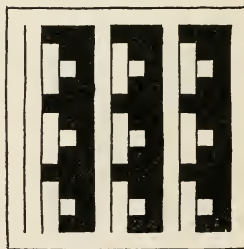
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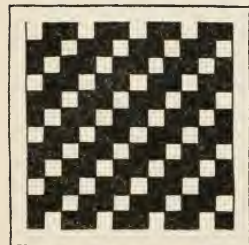
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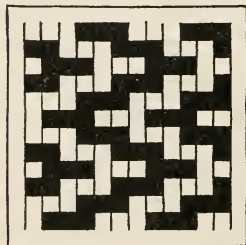
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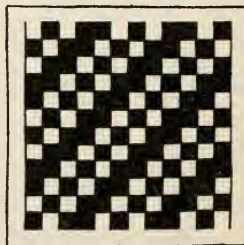
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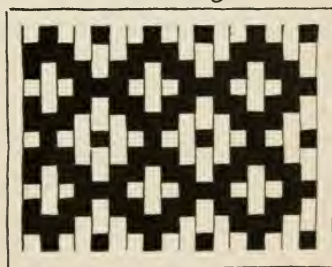
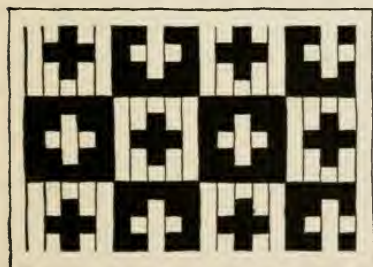
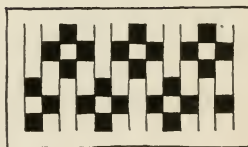
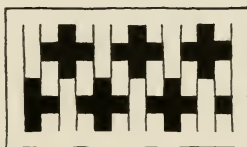
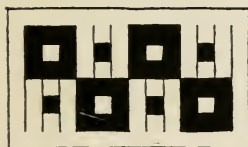
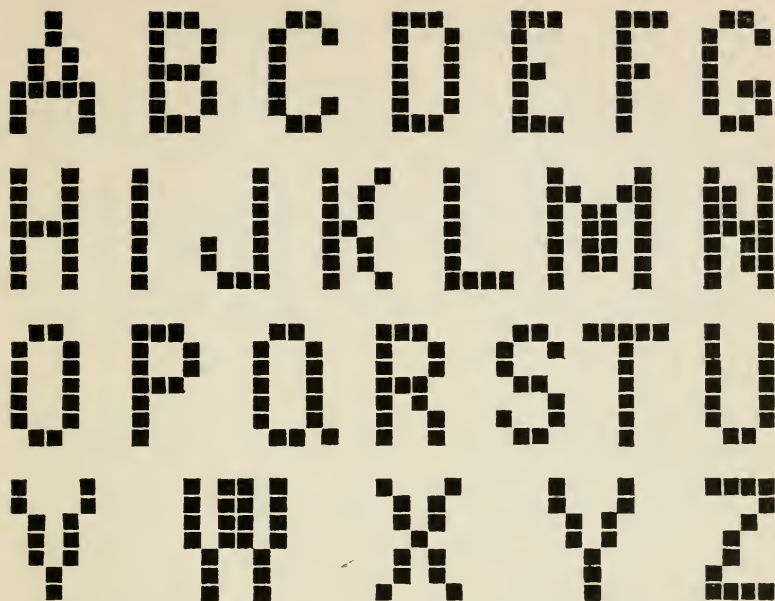


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12





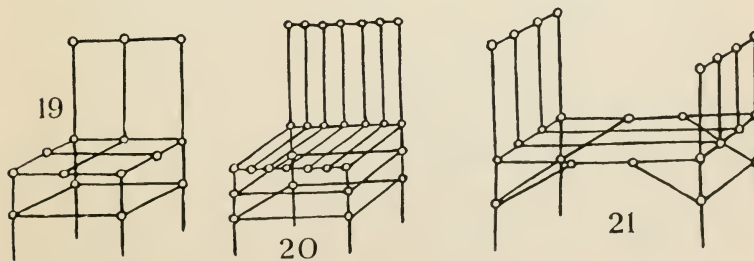
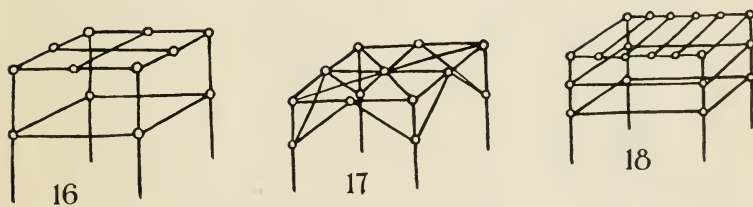
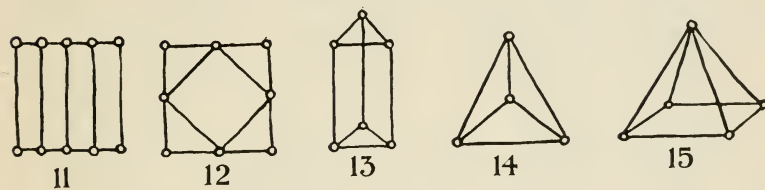
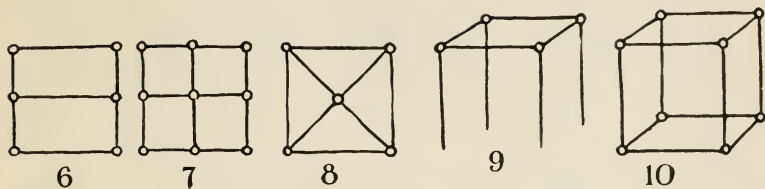
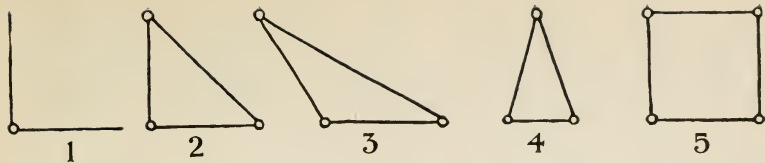


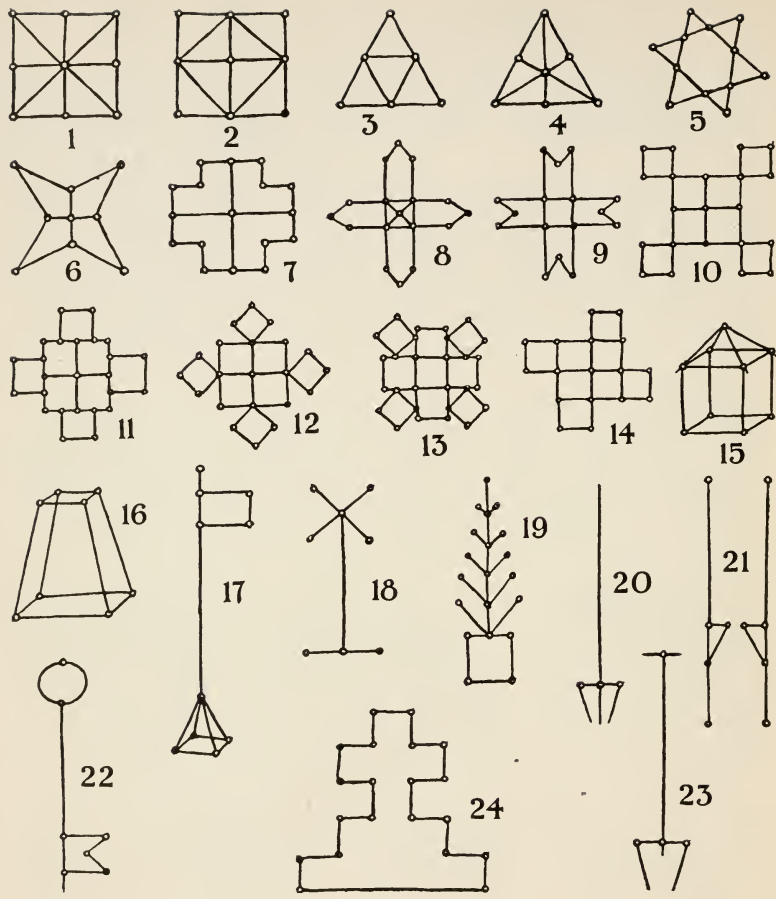
## XI. ELEMENTARY CONSTRUCTION

**Value.** Construction with sticks and pith is interesting, because the child can make forms that he can keep. It has a practical value, because it teaches the child the elements of real construction, namely, proportion, joining, and bracing.

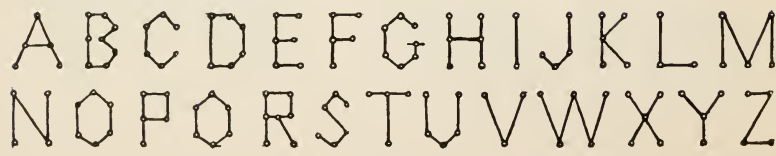
**Material.** The sticks may be made of bamboo, midribs of buri and coconut leaves, etc. If the pupils have long sticks, they can break off the proper lengths as they need them. The ends of the sticks should be sharpened so that they can easily be pushed into the camoting cahoy by which the sticks are joined. Soaked peas may be used in place of camoting cahoy. Balls modeled from clay can also be used to join sticks; when the clay hardens, the forms will be quite rigid.

**Suggestions.** The first exercise may consist in forming angles, triangles, and squares, shown on page 59, Nos. 1-5; also many of the stick-laying models, pages 8-19, may be constructed. Each child might make for himself an alphabet, as shown on page 60, to use in spelling the words given on pages 64-71. When the children have made the square (page 59, No. 5), let them see that it can easily be twisted and pushed out of shape; Nos. 6-8 and 11, 12 show how the square is strengthened or braced. Numbers 16-21 show construction and bracing of tables, chairs, and bed. Let the children understand that every stick in construction is used for a purpose of construction, not merely for ornamentation. Numbers 9 and 10 show the construction of a cube — all sticks must be of the same length; Nos. 14 and 15 show pyramids. On page 60 are suggestions for making geometric and ornamental forms; also pictures of familiar objects. On pages 61 and 62 are suggestions for interesting exercises in pith and stick work. In doing this exercise, the children will learn about the construction of their bodies, the joints, and the names of parts of the body. These figures may also be drawn on sand or leaves, or perforated (page 38) and sewed.



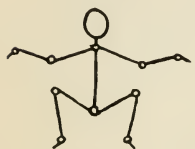



Alphabet made of sticks and pith



○ head    ○ neck    ○ shoulders  
 body    arm    elbow    forearm    wrist    hand


hips    thigh    knee    leg    ankle    foot    standing

  
 squatting

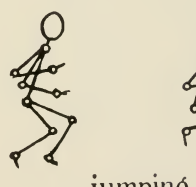
  
 crawling

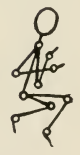
  
 kneeling

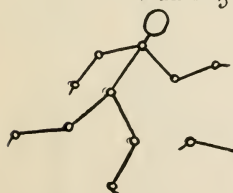
  
 sitting


  
 walking

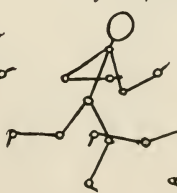


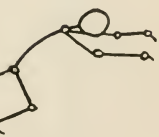
  
 jumping

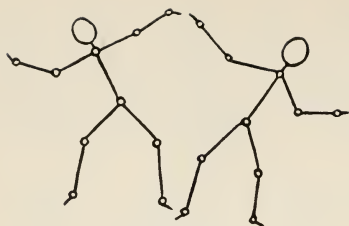


  
 running

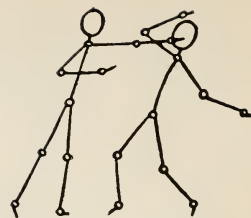
  
 chasing

  
 fleeing

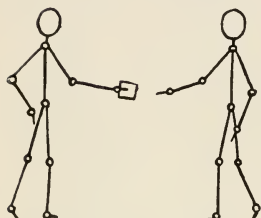
  
 falling



boxing

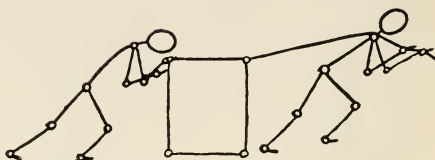


striking dodging



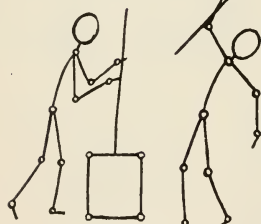
giving

taking

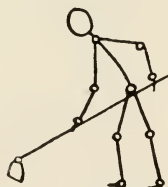


pushing

pulling



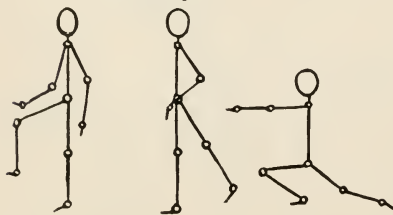
threshing



hoeing



carrying



exercising

## XII. PICTORIAL DICTIONARY

Each of the following 150 words is to be (1) laid with sticks; (2) laid with seeds or shells; (3) made by sewing straws on leaves; (4) drawn in sand; (5) formed by joining sticks with tapioca pith; (6) outlined by sewing with fiber or thread. All of the letter forms except the last are printed forms. The model for sewing script is given below. At the top of each left-hand page is given the model for the six forms in which each word is to be made. Two words should ordinarily be enough for a day's work — one each session. During the exercises, the teacher should frequently pronounce the word the pupils are making with distinctness and clearness, but he should be careful to avoid the appearance of giving a lesson. All the nouns used in *The Philippine Chart Primer* are used in this list.

A B C D E F G

H I J K L M

N O P Q R S T

U V W X Y Z

a b c d e f f

g h i j k l m

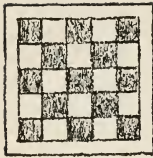
n o p q r r s s

t u v w x y z



MAT

MAT



MAT

MAT

MAT

Mat



MAN



MANGO



WOMAN



WORM



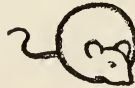
SAW



EAR



SAIL



RAT



SLATE



ARM



SLED



ROACH



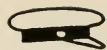
DESK



JAR



WEB



CAP



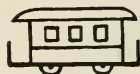
BOW



CAT



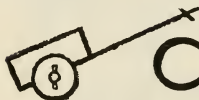
BOY



CAR



BOX



CART



BOOK



CHAIR



TRAY



COT



TRAP



MOTH



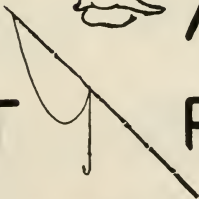
TOP



MOUTH



COLT



ROD



BELT

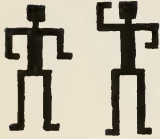


ROPE



MEN

MEN



MEN

MEN

MEN

Men



MOON



PAIL



MAIZE



QUAIL



LEG



BAG



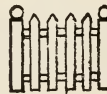
LOG



BAT



DOG



GATE



FROG



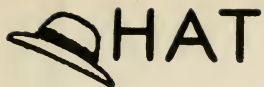
PLATE



FLAG



PLOW



HAT



FAN



CHEST



FACE



FISH



LEAF



SHIP



FIRE



BASKET



GIRL



TABLE



BUD



NEST



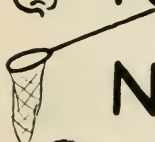
BED



NOSE



BIRD



NET



BEAK



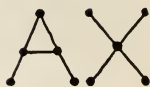
NUT



RATS

AX

AX



AX

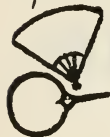
Ax



ANT



WAIST



FANS



BALL



DUCK



HOE



BACK



SHOE



BOAT



SOCK



COAT



SCREW



GOAT



SKIRT



KID



NAILS



KITE



ANTS



KNIFE



HATS



RICE



MATCH



RAKE



TOES



POD



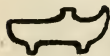
CANE



POT



CHAIN



STOVE



VINE



SPADE



HEAD



LOCUST



WING





OWL

OWL

OWL

OWL

OWL

Owl



BOWL



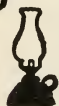
CRAB



CROW



CAGE



LAMP



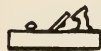
HOUSE



LAMB



HORSE



PLANE



HERON



BANANA



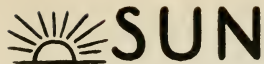
HAND



PLANT



HAWK



SUN



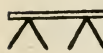
THUMB



HEN



COMB



BENCH



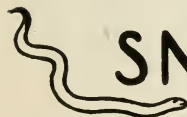
BONE



HORNS



KNOT



SNAKE



KEY



PIG



SHELL



GUN



WATCH



CUP



CHART



PENCIL



STAMP



CANDLE



SWING

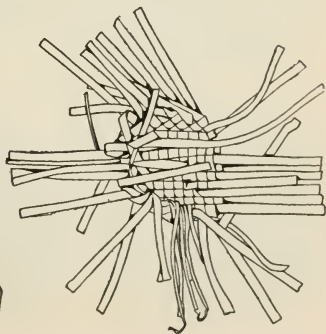
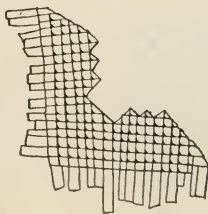
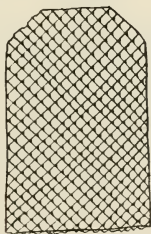
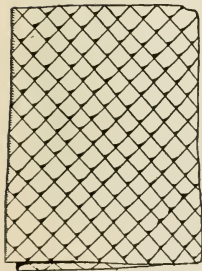
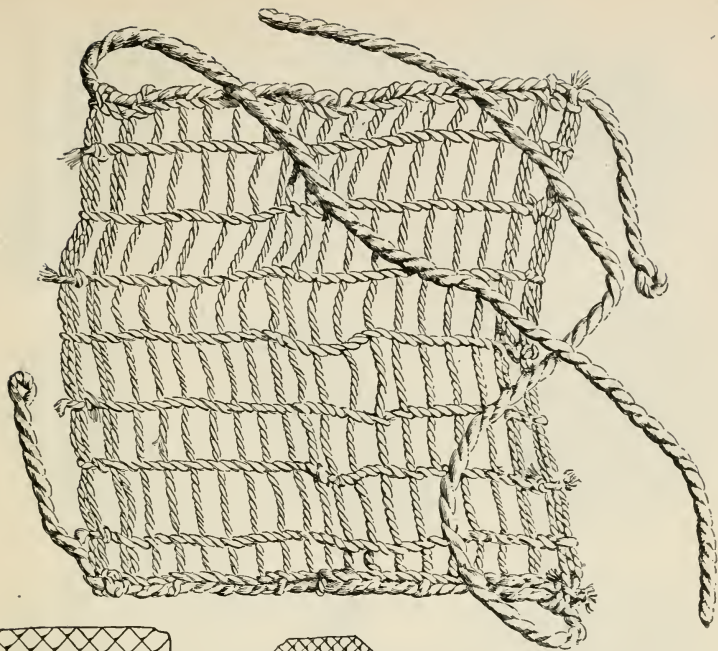
### XIII. HAND WEAVING

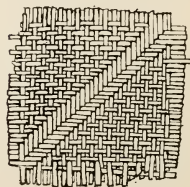
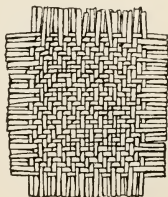
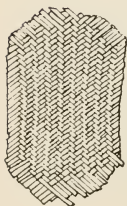
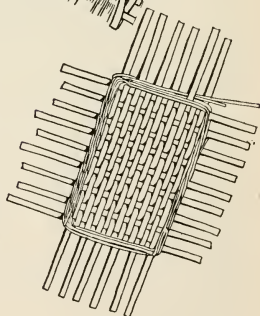
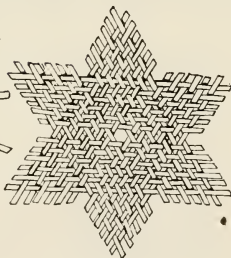
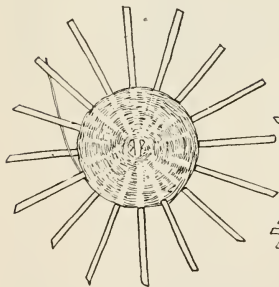
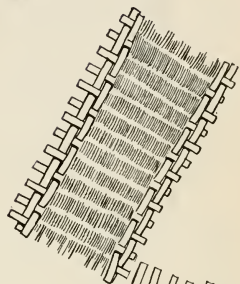
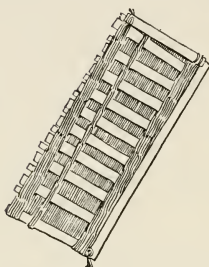
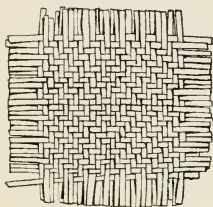
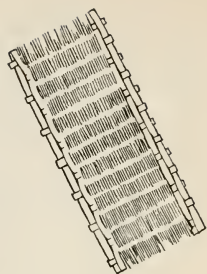
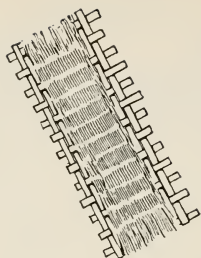
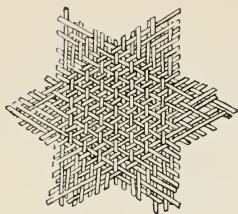
When he reaches this point, the pupil has learned the pronunciation and meaning of a number of words through dealing with objects, and has acquired the ability to talk about many familiar things. He has attained a knowledge of reading and language, through a variety of interesting exercises, while his center of interest was the doing of something. This knowledge was acquired without conscious effort on his part and with only a slight tax upon the teacher's time, patience, and ingenuity. Number work, in the stick-laying exercises particularly, was prominent. The pupil has been taught to write the new word as it came to him in connection with his writing, language, and industrial work. All the exercises furnish the foundation for drawing, and many of them are in themselves really drawing exercises.

All the recreation exercises not provided for in *The Philippine Chart Primer* and *The First Year Book* have been covered, while many features of these books have been expanded to relieve the teacher of all avoidable burdens, so that there might be more time for the work which demands personal attention.

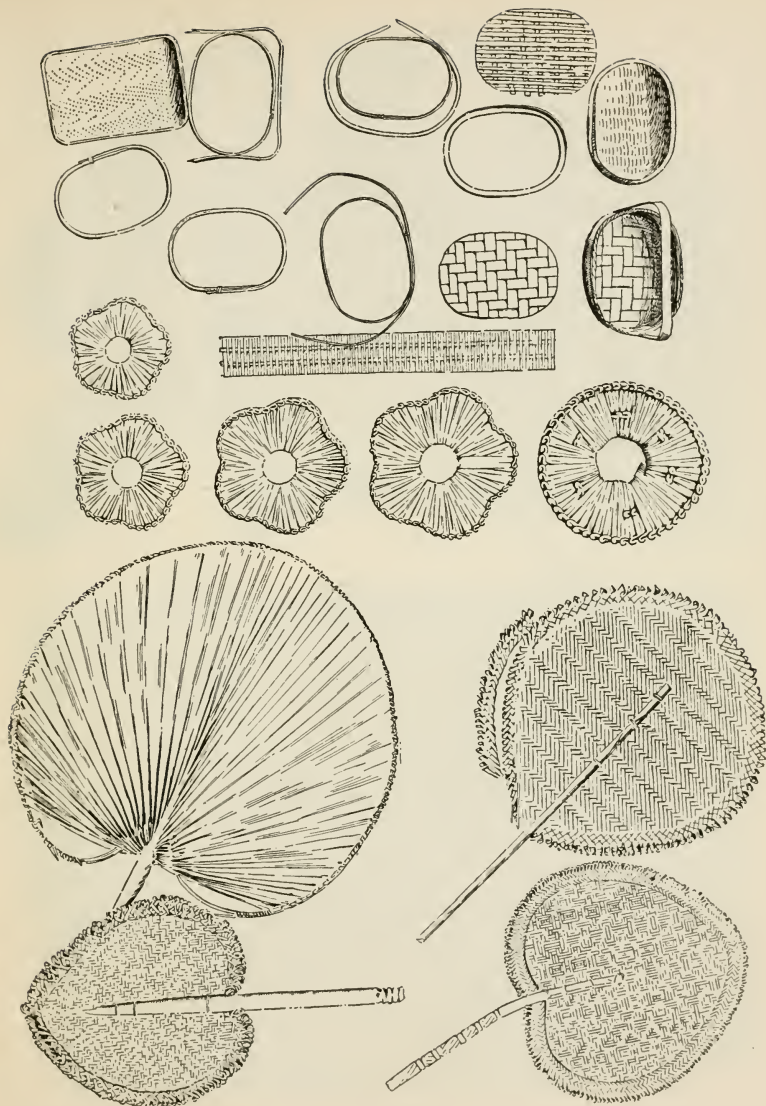
Besides gardening, already covered in a special bulletin of the Bureau of Education, there remains only the application of hand weaving to articles simple enough for Grade I pupils to make. Illustrations follow of mats and bags of buri, caragomoi, and other similar fibers; fans, trays, picture frames of a combination of buri or caragomoi with bamboo or rattan; small baskets from buri, caragomoi, coconut fiber, with nito and irao for finishing and decorating.

Most of the articles pictured were in an exhibit made at the Manila Carnival in 1911 by Gil Raval, a teacher of Laoag, Ilokos Norte. The purpose here is to offer ideas and suggestions which those who are familiar with weaving can carry out and adapt to other purposes. Further suggestions and more detail of processes, as well as clear treatment of the different kinds of weaving, are found in Reimold's *Industrial Studies and Exercises: Teachers' Edition*.

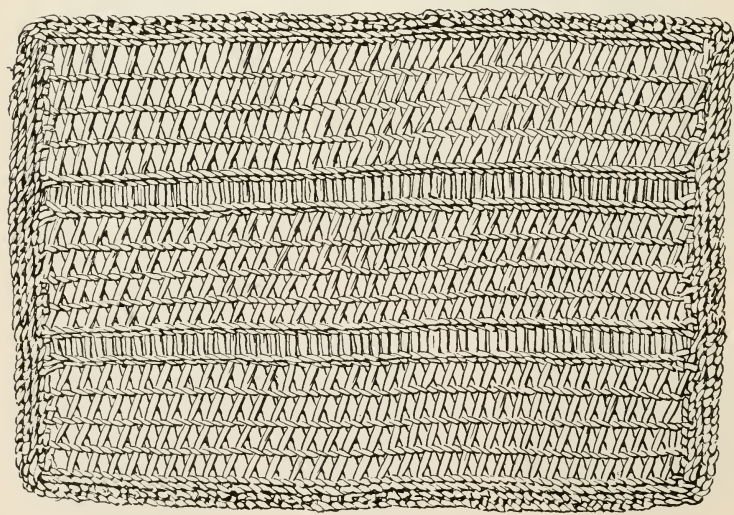
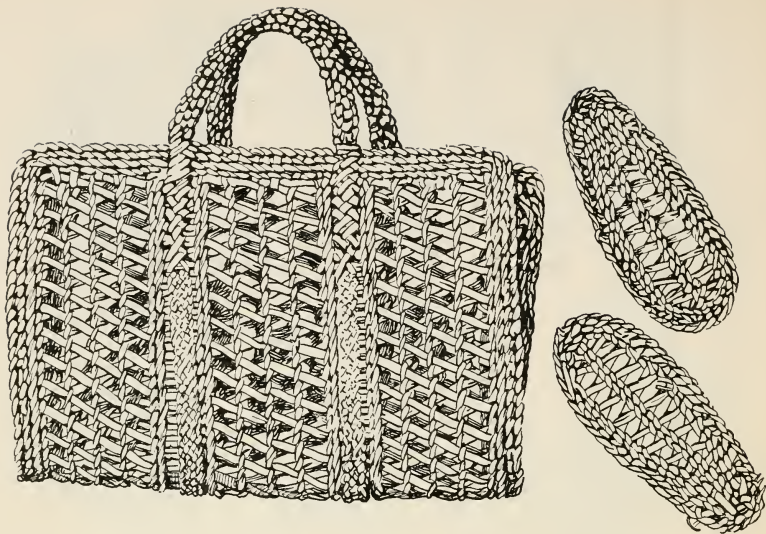


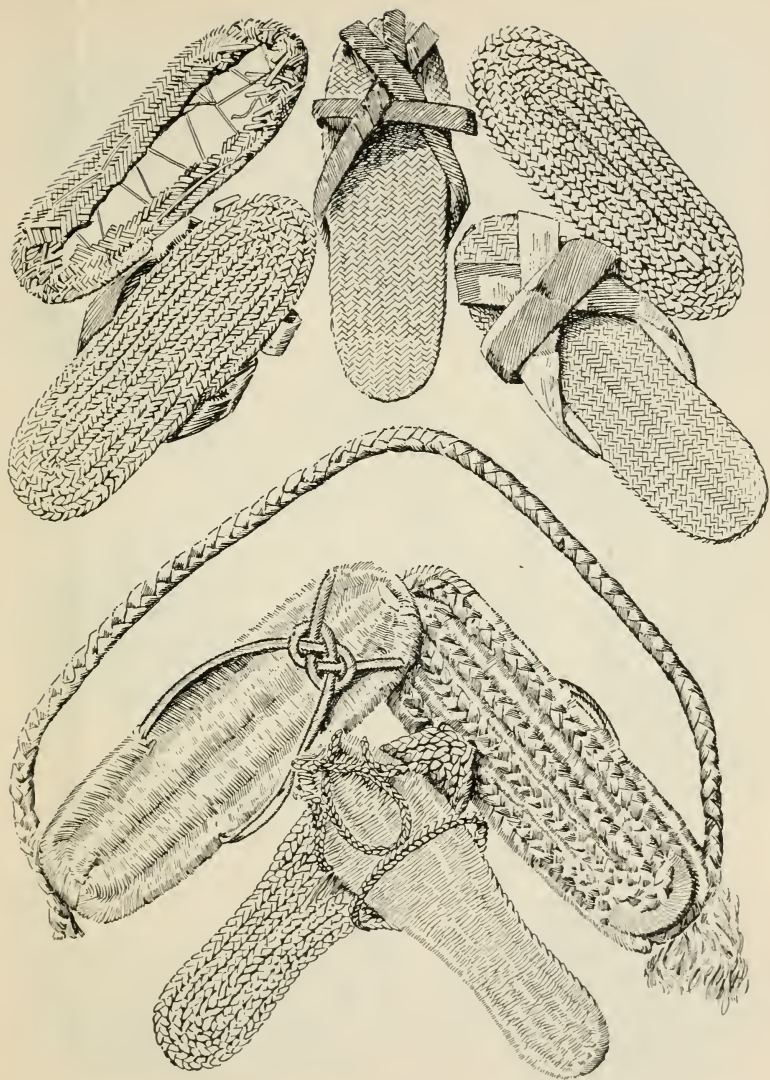


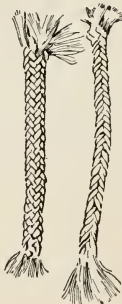
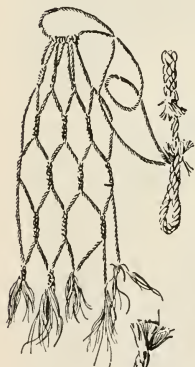
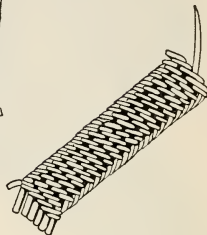
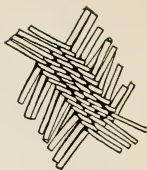
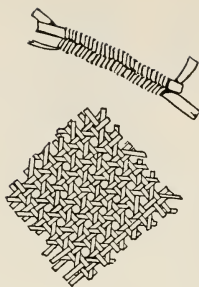
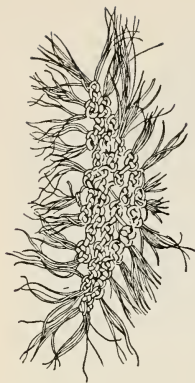




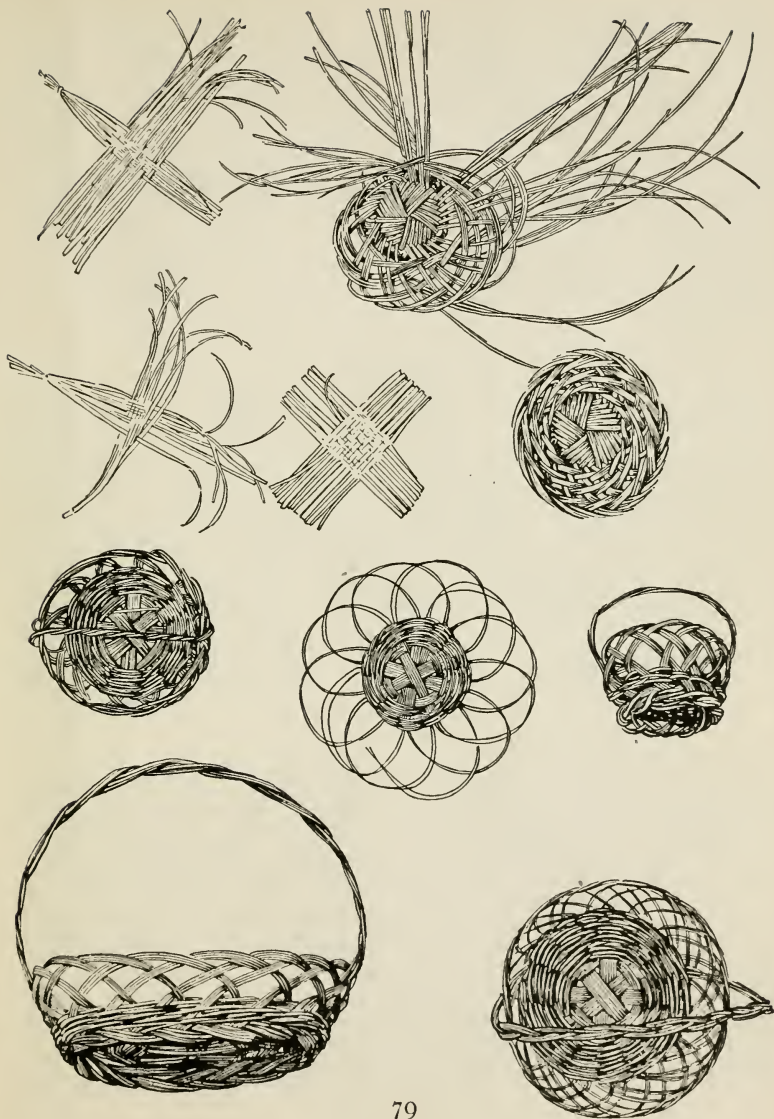


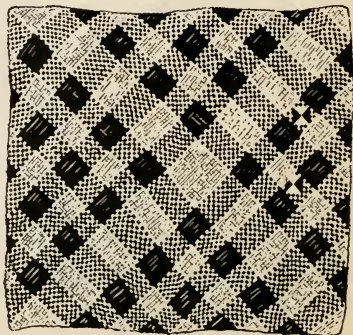
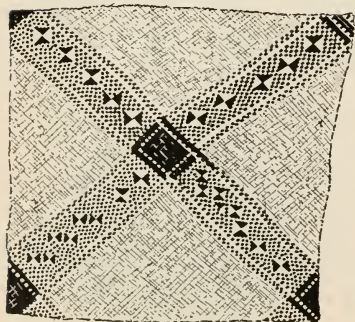
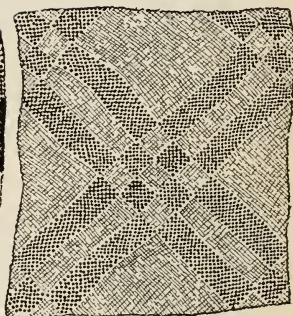
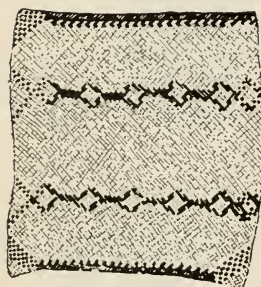
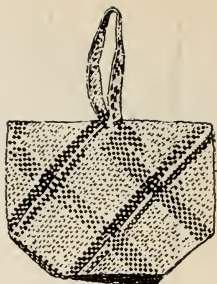
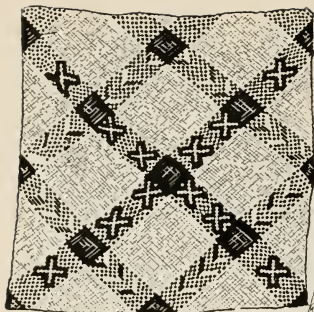
















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ALL BOOKS MAY BE RECALLED AFTER 7 DAYS

- 2-month loans may be renewed by calling (510) 642-6753
  - 1-year loans may be recharged by bringing books to NRLF
  - Renewals and recharges may be made 4 days prior to due date.
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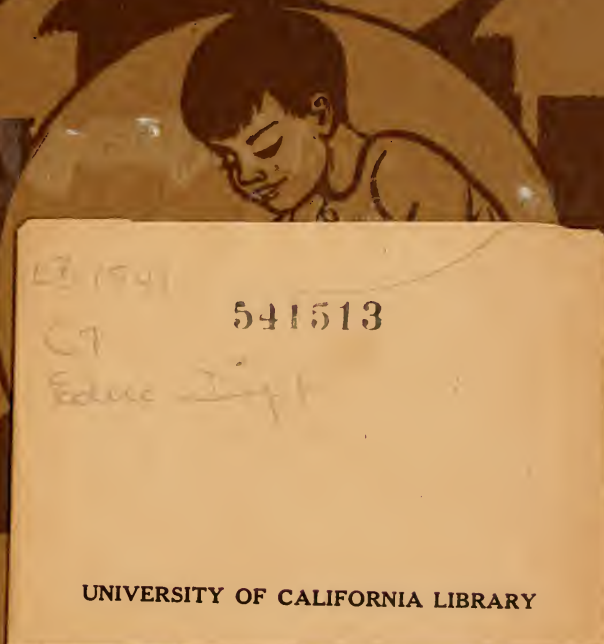
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